

501-27 Front End Sheet Metal Repairs
Removal and Installation

2021 F-150

Procedure revision date: 09/25/2020

Cowl Panel

Special Tool(s) / General Equipment

6.5 mm Drill Bit
Polydrive Bit Socket
Self-Piercing Rivet (SPR) Remover/Installer
Belt Sander
Blind Rivet Gun
6 mm Drill Bit
Locking Pliers

Materials

Name	Specification
Metal Bonding Adhesive TA-1, TA-1-B, 3M™ 08115, LORD Fusor® 108B	-

Removal

 **WARNING:** Electric vehicles damaged by a crash may have compromised high voltage safety systems and present a potential high voltage electrical shock hazard. Exercise caution and wear appropriate Personal Protective Equipment (PPE) safety gear, including high voltage safety gloves and boots. Remove all metallic jewelry, including watches and rings. Isolate the HV system as directed by the Ford Emergency Response Guide for the vehicle. Failure to follow these instructions may result in serious personal injury or death.

NOTICE: Battery electric vehicle (BEV), hybrid electric vehicle (HEV) and plug-in hybrid electric vehicle (PHEV) contain a high-voltage battery. Before cutting or welding near the high-voltage battery it must be removed to avoid damage.

-  **WARNING:** Before beginning any service procedure in this manual, refer to health and safety warnings in section 100-00 General Information. Failure to follow this instruction may result in serious personal injury.

Refer to: [Health and Safety Precautions](#) (100-00 General Information, Description and Operation).

Refer to: [High Voltage System Health and Safety Precautions - Overview](#) (100-00 General Information, Description and Operation).

NOTE: Aluminum body panels are highly receptive to heat transfer. With the extensive use of structural adhesives and non-structural sealers used in vehicle construction, the potential of heat transfer could impact adhesives and sealers in non-associated panels during the repair process. Many repairs areas that utilize structural adhesive may be separated after fastener removal by using a panel chisel along the joint/flange. Using heat not exceeding 425° F to loosen a bonded panel should only be done when all panels in the joint will be replaced and new adhesive applied.

2. Depower the SRS.
Refer to: [Supplemental Restraint System \(SRS\) Depowering](#) (501-20B Supplemental Restraint System, General Procedures).
3. Verify the vehicle is dimensionally correct.
Refer to: [Body and Frame](#) (501-26 Body Repairs - Vehicle Specific Information and Tolerance Checks, Description and Operation).
4. **On Both Sides:**
Remove the fender apron panel reinforcement.
Refer to: [Fender Apron Panel Reinforcement](#) (501-27 Front End Sheet Metal Repairs, Removal and Installation).
5. Remove the cowl trim panel and cowl panel grille.
Refer to: [Cowl Panel](#) (501-02 Front End Body Panels, Removal and Installation).
Refer to: [Cowl Panel Grille](#) (501-02 Front End Body Panels, Removal and Installation).
6. Remove the wiper motor and linkage.
Refer to: [Windshield Wiper Motor](#) (501-16 Wipers and Washers, Removal and Installation).
Refer to: [Wiper Linkage Assembly](#) (501-16 Wipers and Washers, Removal and Installation).
7. Remove the windshield.
Refer to: [Fixed Glass](#) (501-11 Glass, Frames and Mechanisms, General Procedures).
8. Remove the instrument panel.
Refer to: [Instrument Panel](#) (501-12 Instrument Panel and Console, Removal and Installation).
9. Remove the master cylinder.
Refer to: [Brake Fluid Reservoir](#) (206-06 Hydraulic Brake Actuation, Removal and Installation).
10. Remove the PCM .
Refer to: [Powertrain Control Module \(PCM\)](#) (303-14A Electronic Engine Controls - 2.7L EcoBoost (238kW/324PS), Removal and Installation).
Refer to: [Powertrain Control Module \(PCM\)](#) (303-14B Electronic Engine Controls - 3.3L Duratec-V6, Removal and Installation).
Refer to: [Powertrain Control Module \(PCM\)](#) (303-14A Electronic Engine Controls - 2.7L EcoBoost (238kW/324PS), Removal and Installation).
Refer to: [Powertrain Control Module \(PCM\)](#) (303-14D Electronic Engine Controls - 3.5L V6 PowerBoost (CN), Removal and Installation).
Refer to: [Powertrain Control Module \(PCM\)](#) (303-14E Electronic Engine Controls - 5.0L 32V Ti-VCT, Removal and Installation).
Refer to: [Powertrain Control Module \(PCM\)](#) (303-14F Electronic Engine Controls - 3.0L Power Stroke Diesel, Removal and Installation).
11. Position aside carpet and wire harnesses as necessary.

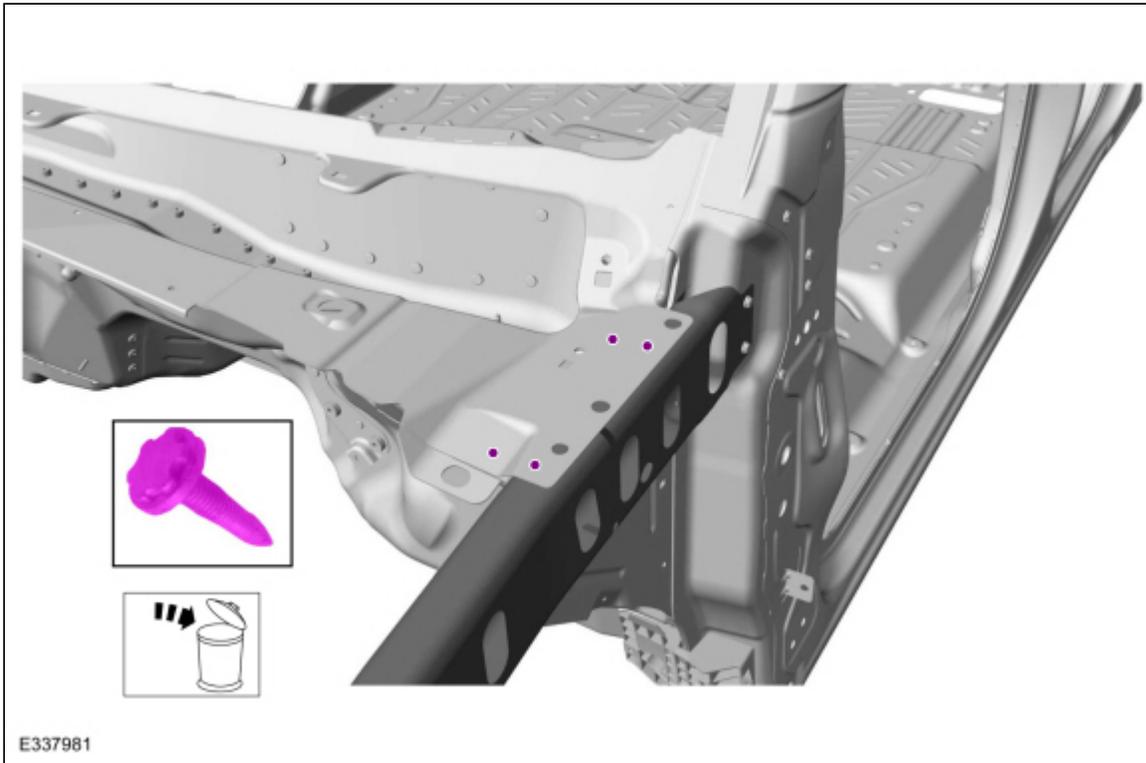
NOTE: Aluminum body panels are highly receptive to heat transfer. With the extensive use of structural adhesives and non-structural sealers used in vehicle construction, the potential of heat transfer could impact adhesives and sealers in non-associated panels during the repair process. Many repairs areas that utilize structural adhesive may be separated after fastener removal by using a panel chisel along the joint/flange. Using heat not exceeding 425° F to loosen a bonded panel should only be done when all panels in the joint will be replaced and new adhesive applied.

12. **NOTE: Upper Cowl Panel:**

On Both Sides:

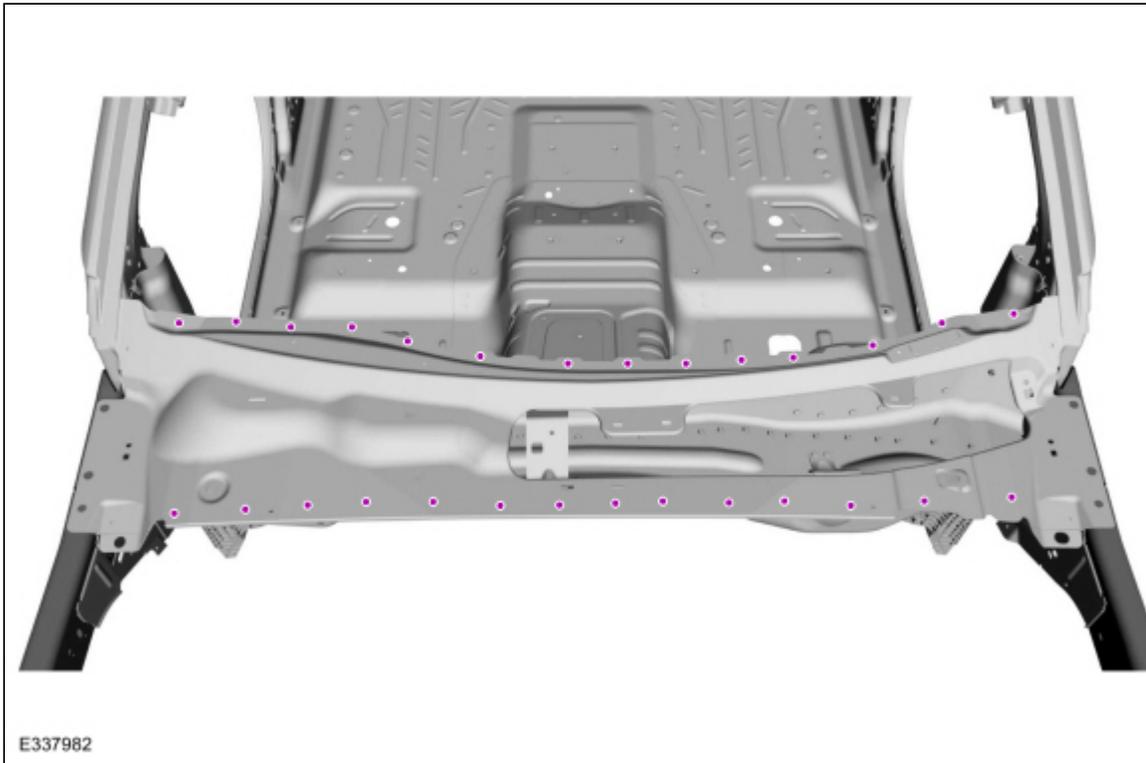
Remove and discard FDS.





- 13. Remove the clinch type fasteners on the front and rear flanges of cowl panel.
Use the General Equipment: 6 mm Drill Bit

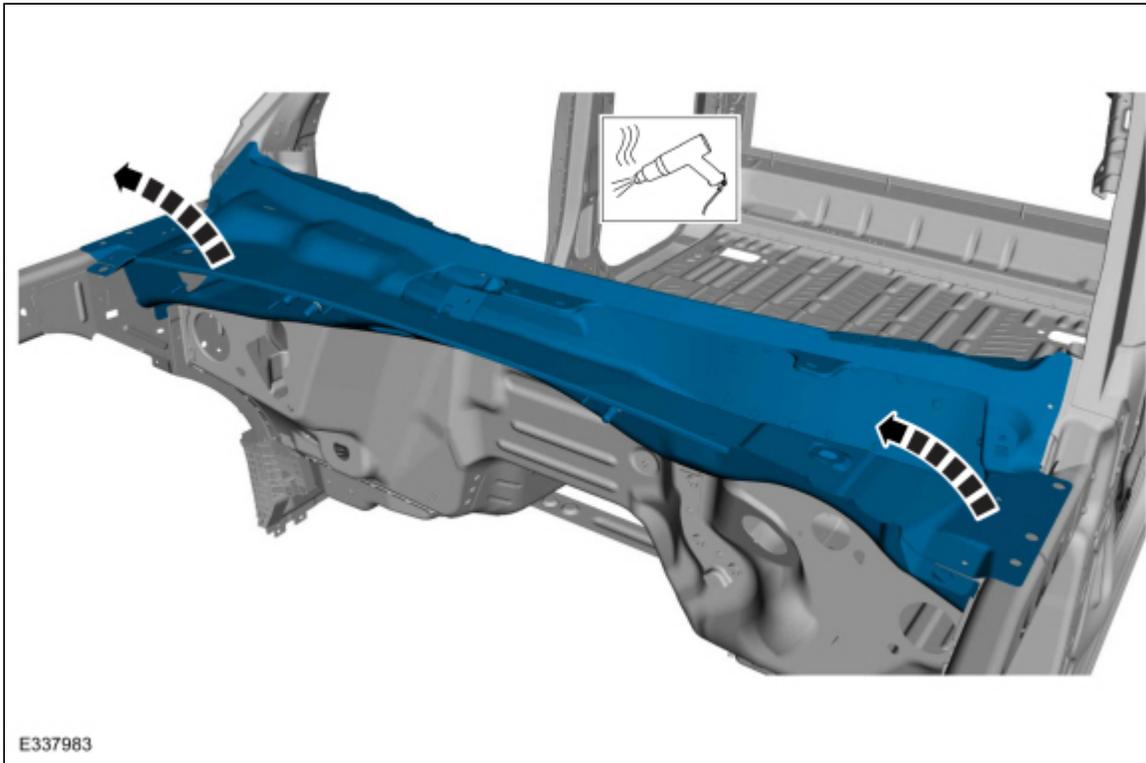




14. Break the adhesive bond and remove the upper cowl panel.

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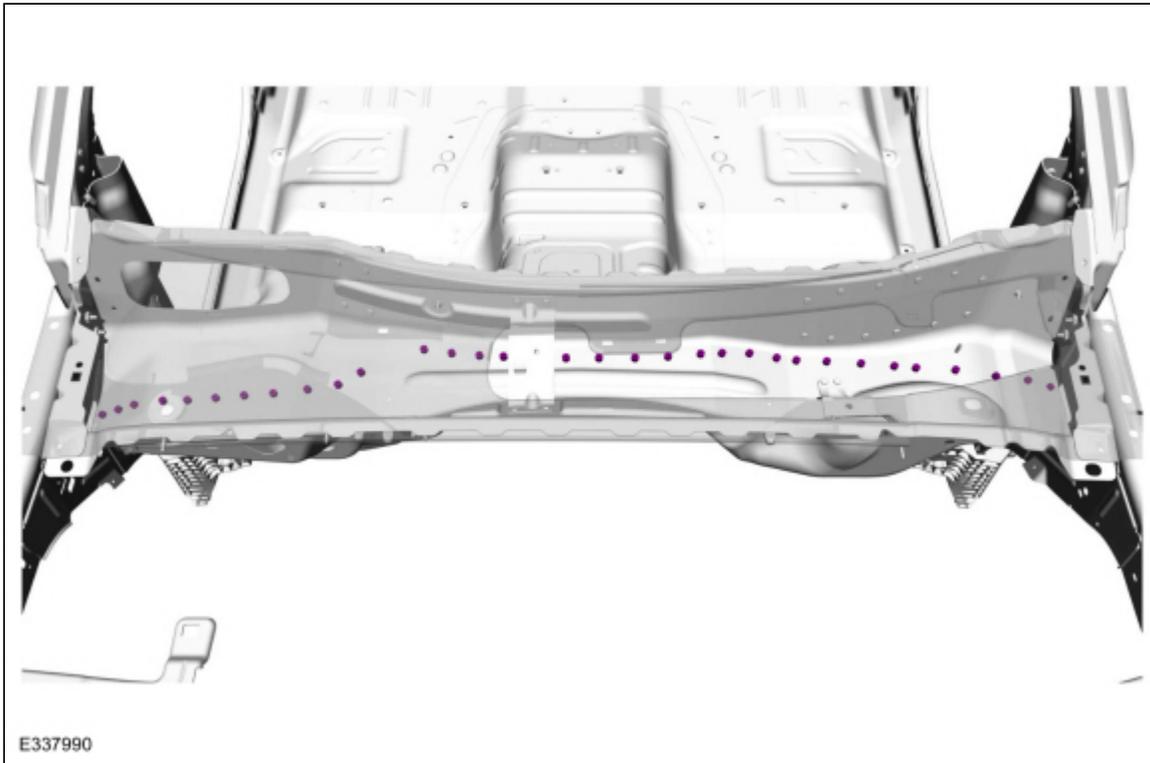


15. Lower Cowl Panel:

Remove the clinch fasteners.

Use the General Equipment: 6 mm Drill Bit

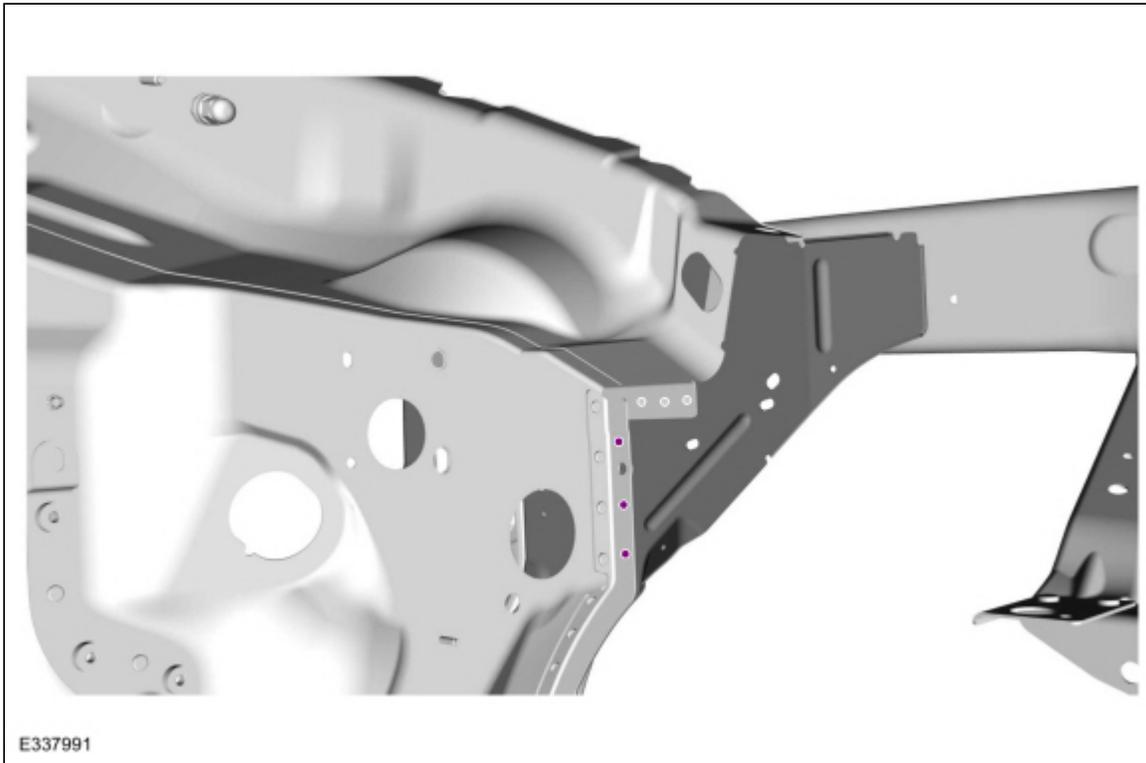




- 16. Remove the SPR fasteners on the LH side.
Use the General Equipment: Self-Piercing Rivet (SPR) Remover/Installer
Use the General Equipment: Belt Sander

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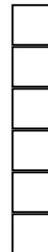
- 17. Remove the SPR fasteners LH side passenger compartment.
Use the General Equipment: Self-Piercing Rivet (SPR) Remover/Installer
Use the General Equipment: Belt Sander

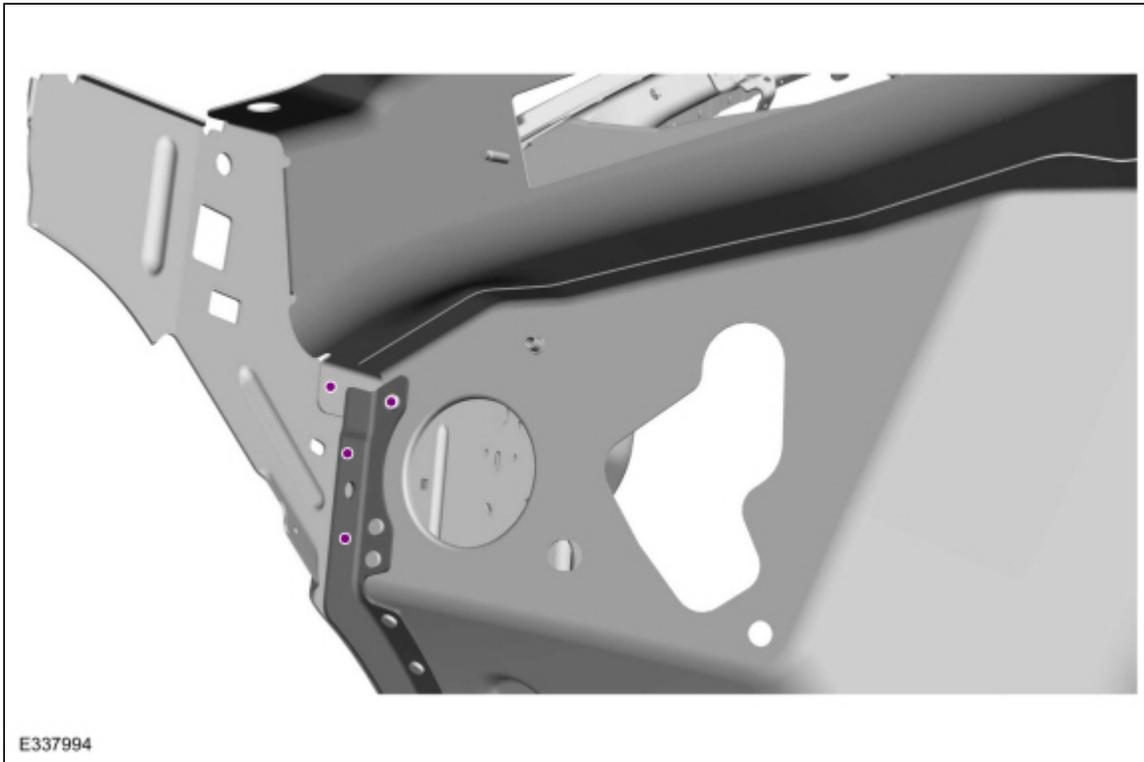
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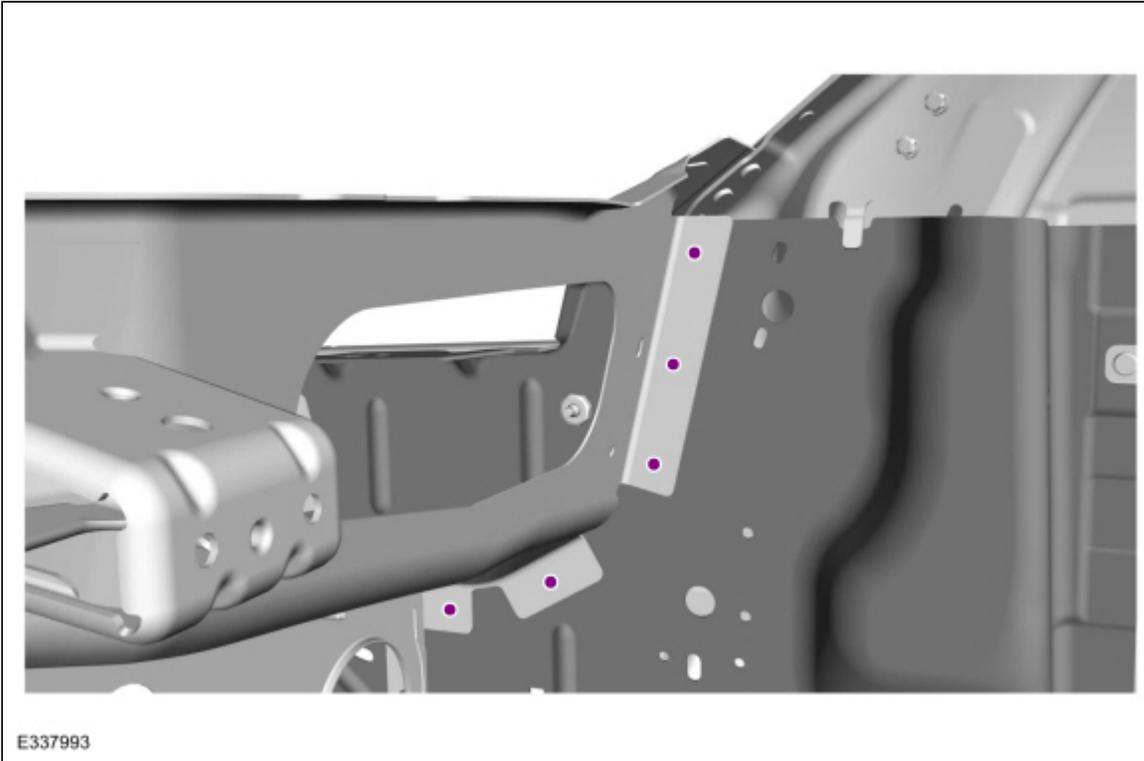
- 18. Remove the SPR fasteners on the RH side.
Use the General Equipment: Self-Piercing Rivet (SPR) Remover/Installer
Use the General Equipment: Belt Sander





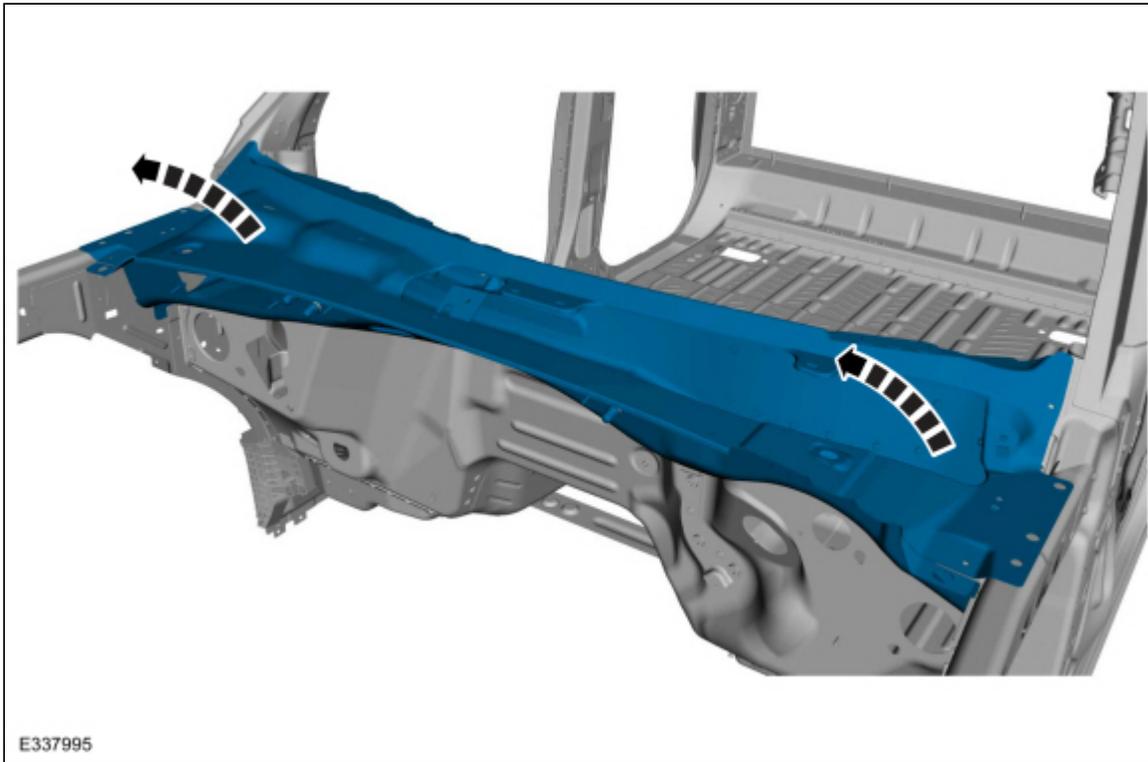
19. Remove the SPR fasteners on the RHside passenger compartment.
Use the General Equipment: Self-Piercing Rivet (SPR) Remover/Installer
Use the General Equipment: Belt Sander





20. Break the adhesive bond and remove the lower cowl panel.





21. Cowl Side Inner Panel:

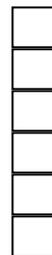
Remove the A-pillar reinforcement on the affected side.

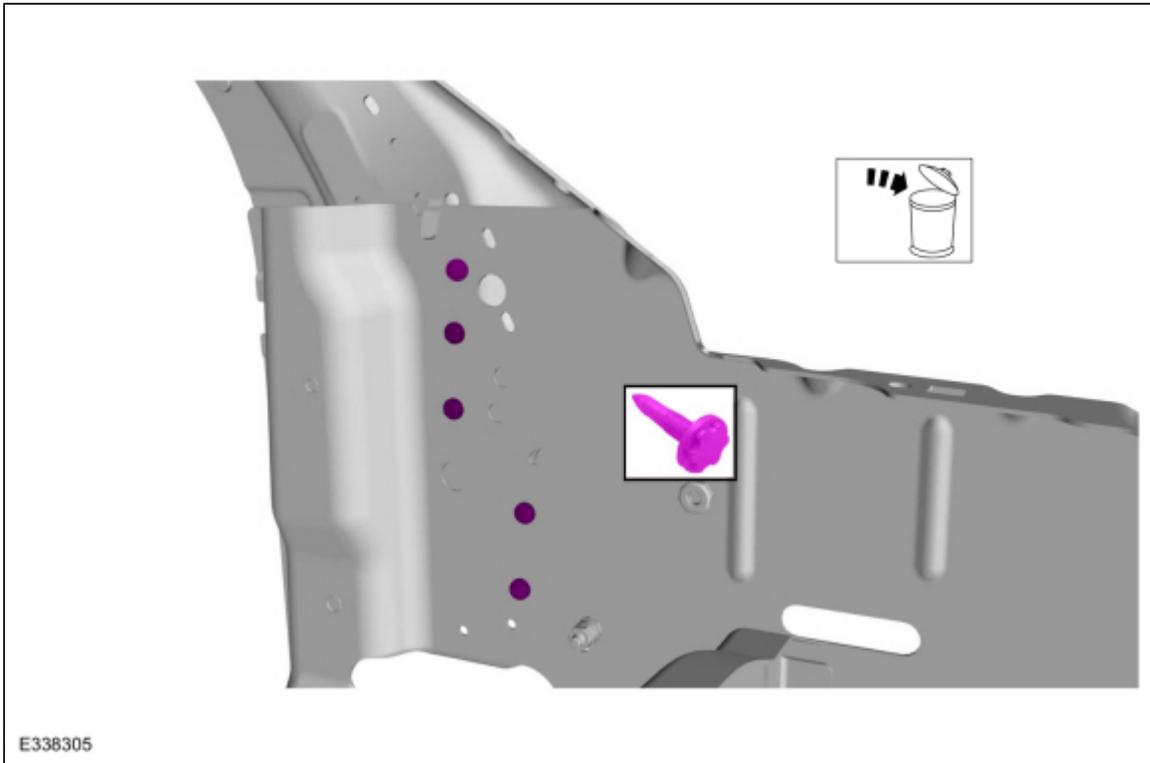
Refer to: [A-Pillar Outer Panel Section and Reinforcement](#) (501-29 Side Panel Sheet Metal Repairs, Removal and Installation).

22. NOTE: *Left hand (LH) side shown, right hand side (RH) similar.*

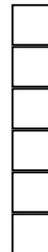
Remove the FDSfasteners.

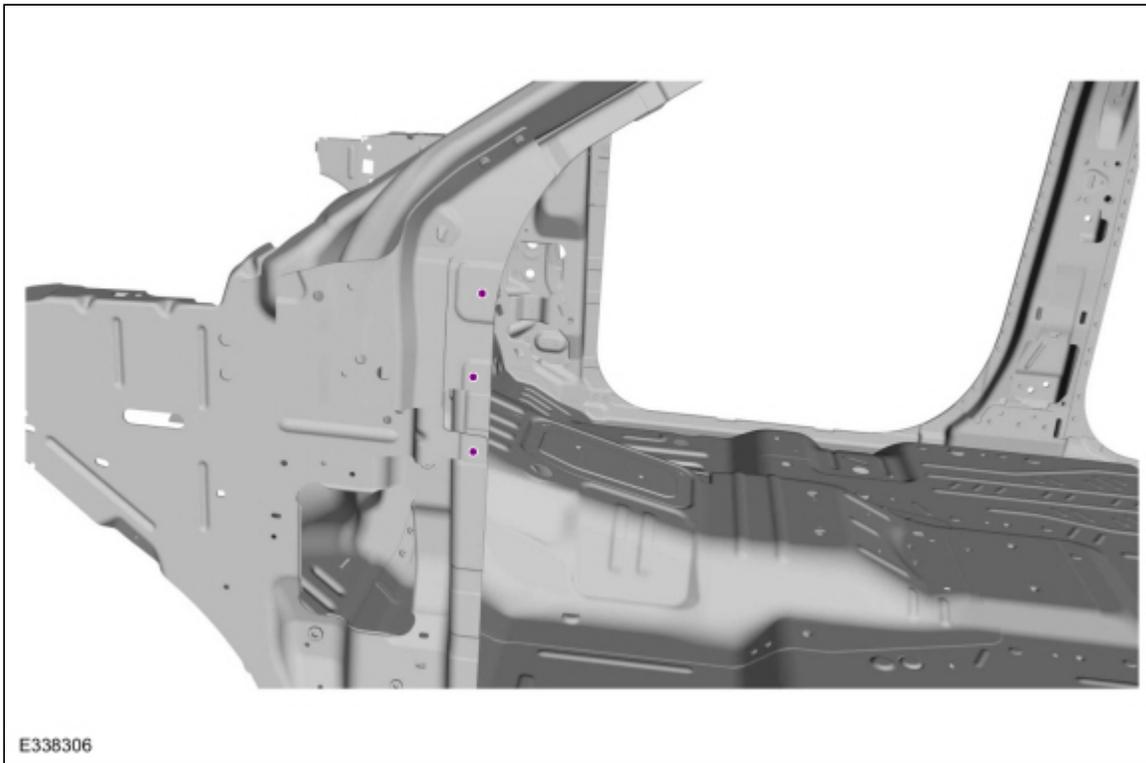
Use the General Equipment: Polydrive Bit Socket





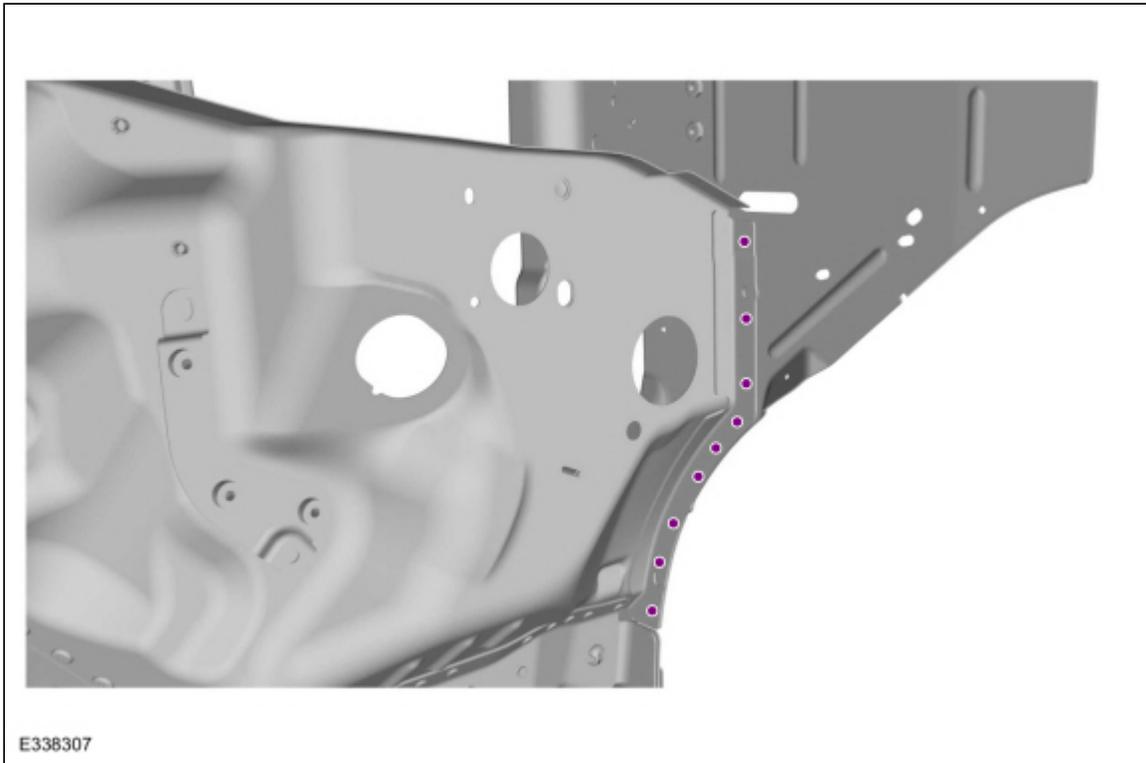
- 23. Remove the SPR fasteners.
Use the General Equipment: Belt Sander
Use the General Equipment: Self-Piercing Rivet (SPR) Remover/Installer



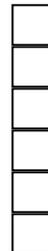


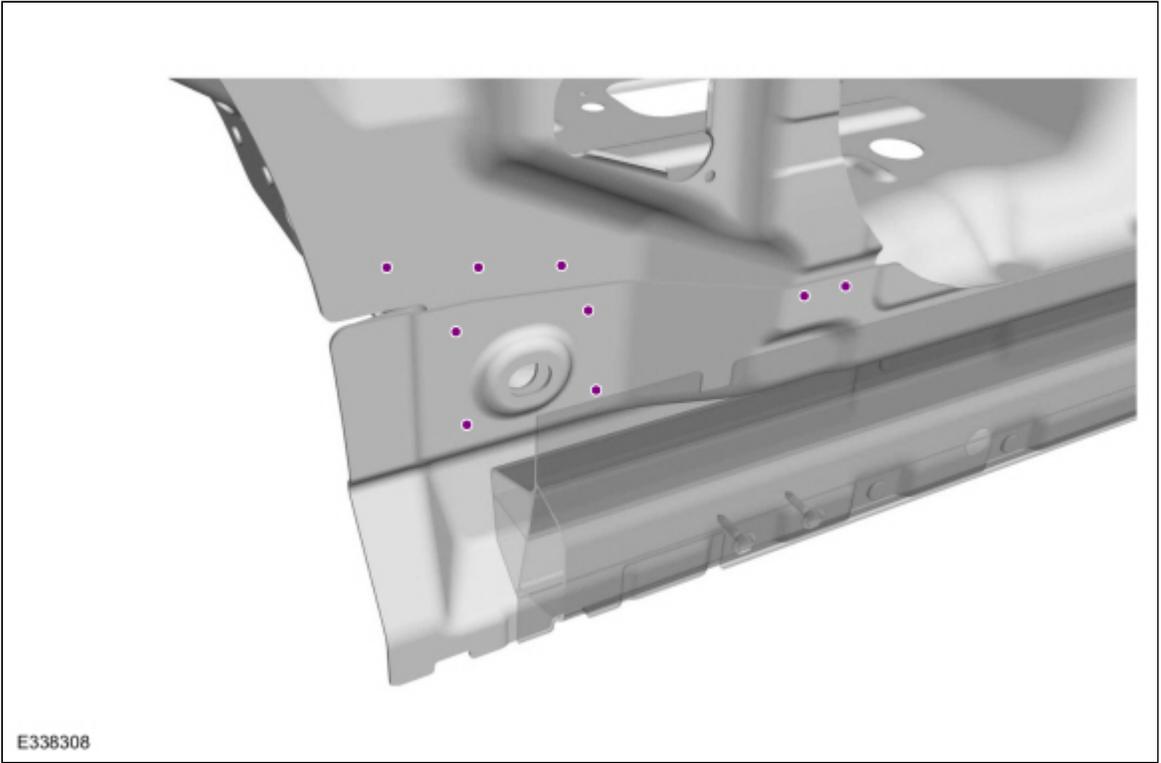
- 24. Remove the SPR fasteners.
Use the General Equipment: Belt Sander
Use the General Equipment: Self-Piercing Rivet (SPR) Remover/Installer





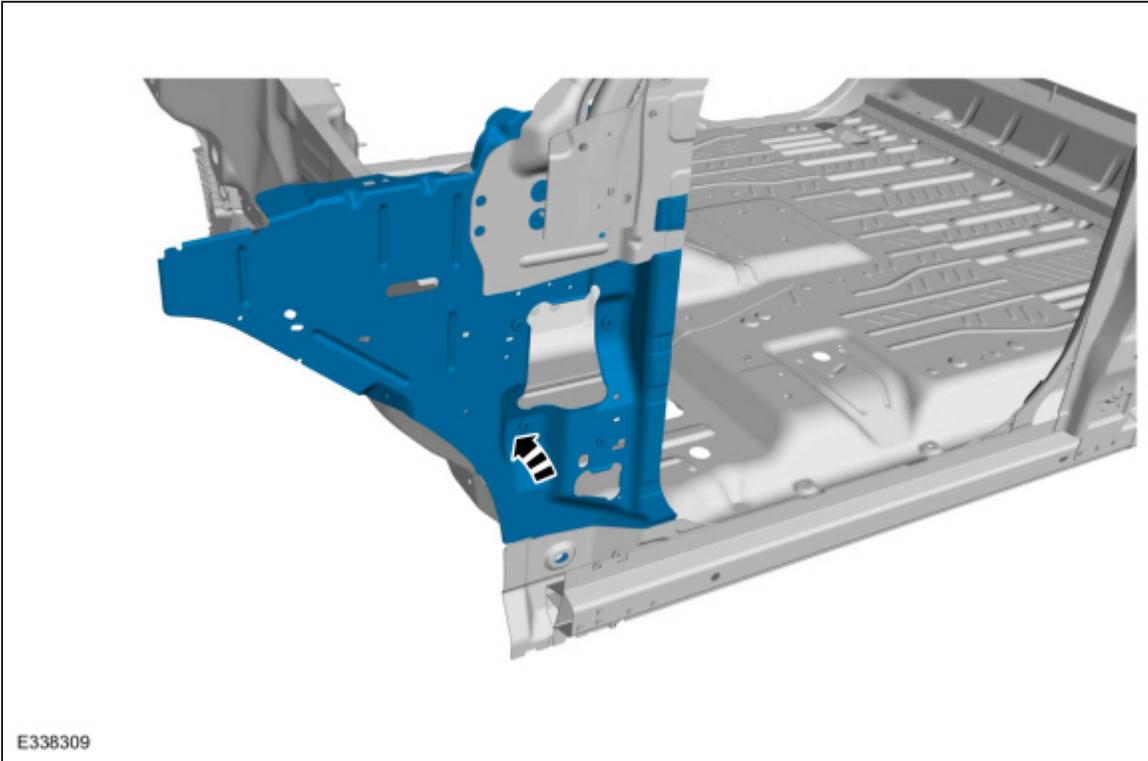
- 25. Remove the SPR fasteners.
Use the General Equipment: Belt Sander
Use the General Equipment: Self-Piercing Rivet (SPR) Remover/Installer





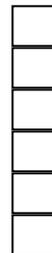
26. Break the adhesive bond and remove the cowl side panel.

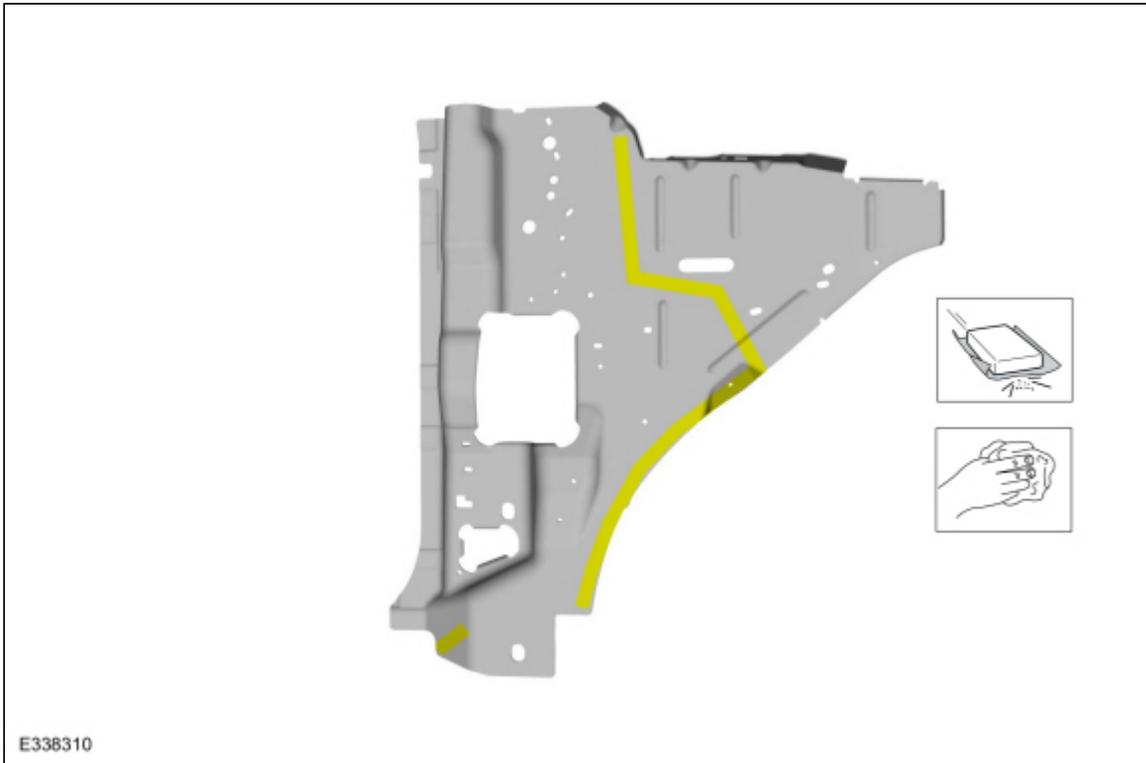




Installation

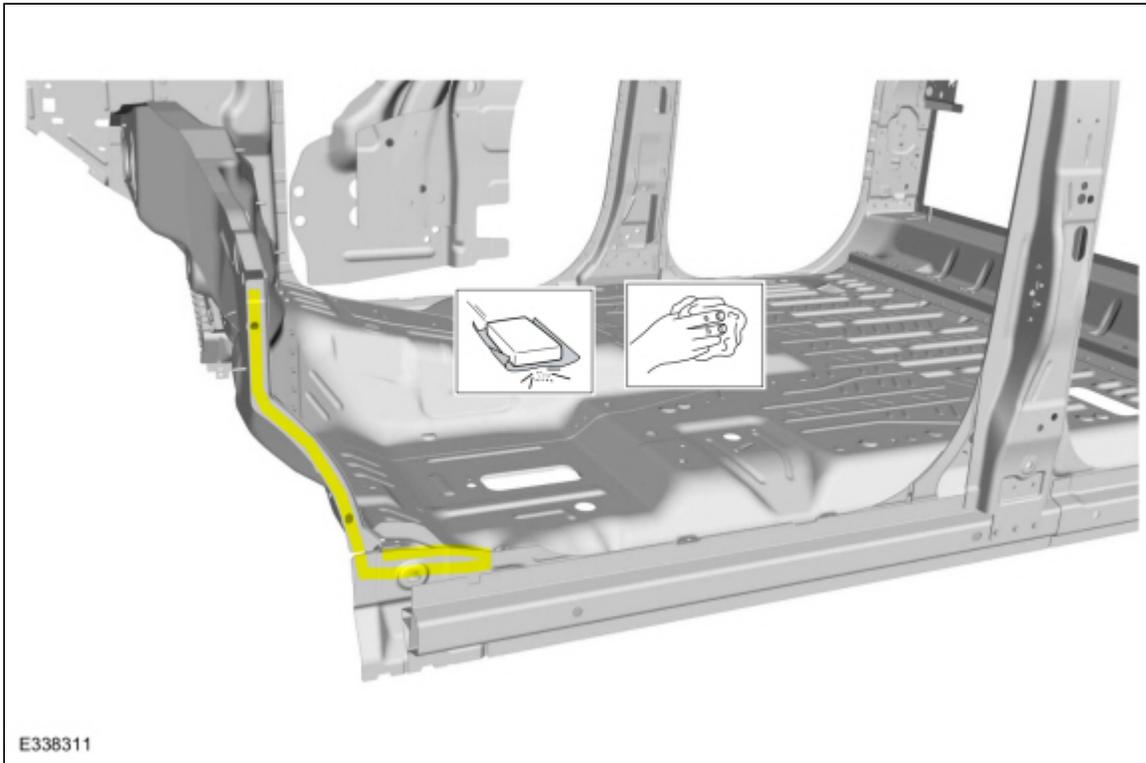
1. Sand to remove e-coating from replacement panel.





2. Sand to remove old adhesive from mating flanges.

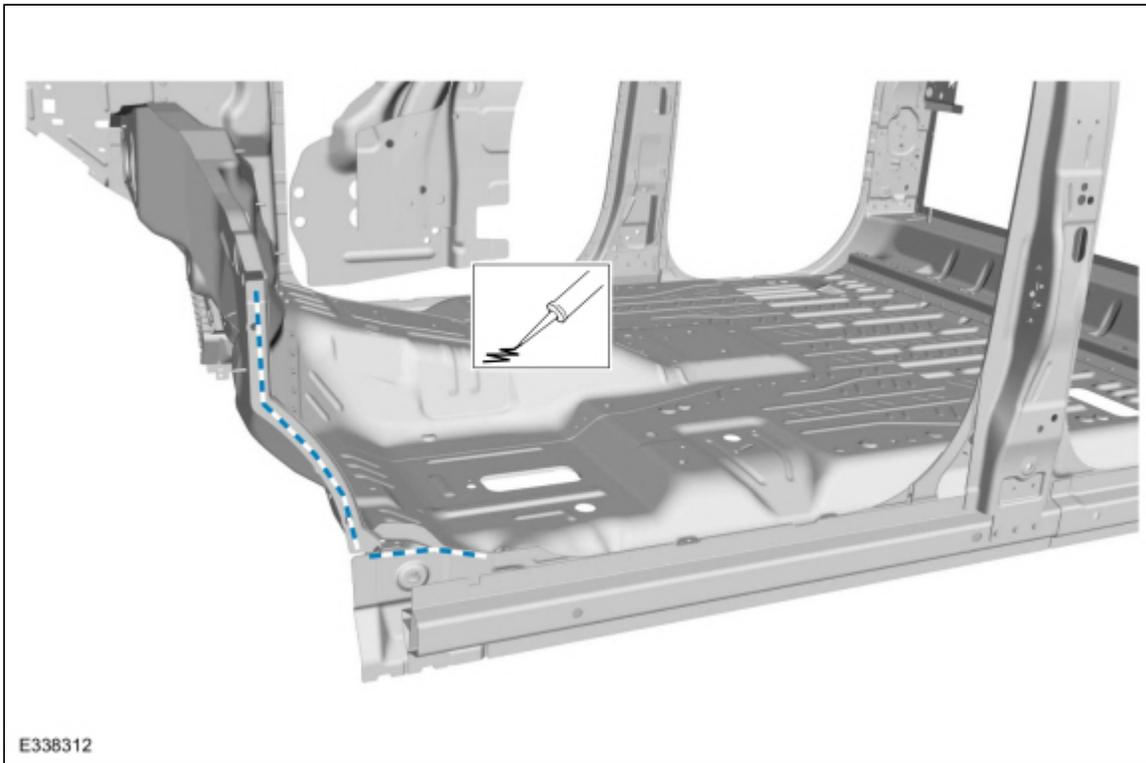




3. Apply adhesive.

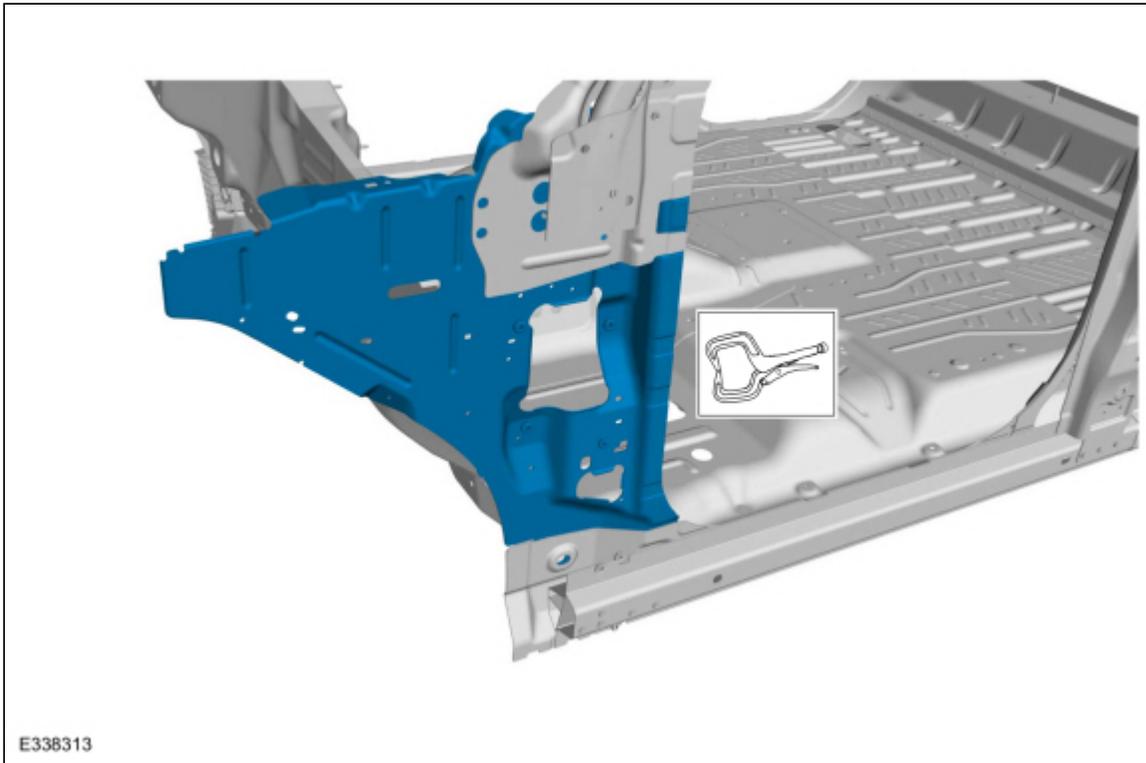
Material: Metal Bonding Adhesive / TA-1, TA-1-B, 3M™ 08115, LORD Fusor® 108B





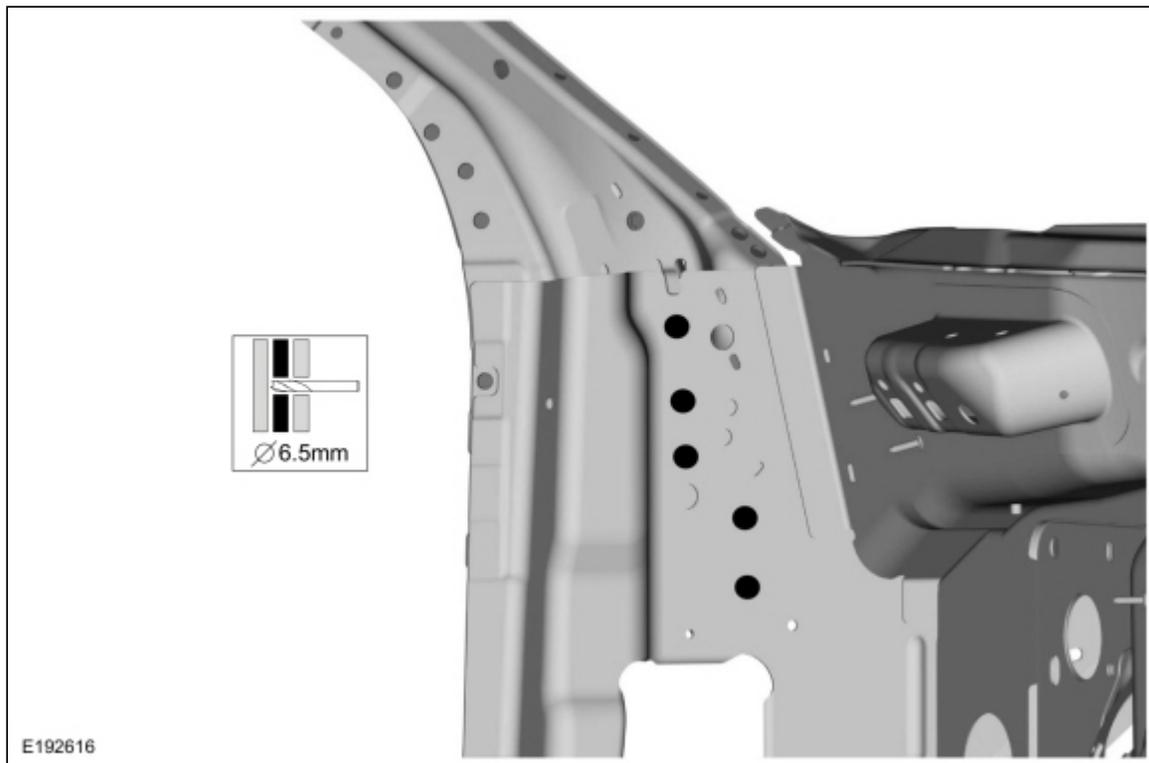
- 4. Install, properly position and clamp the cowl side panel.
Use the General Equipment: Locking Pliers





- 5. Enlarge original FDS holes as indicated.
Use the General Equipment: 6.5 mm Drill Bit



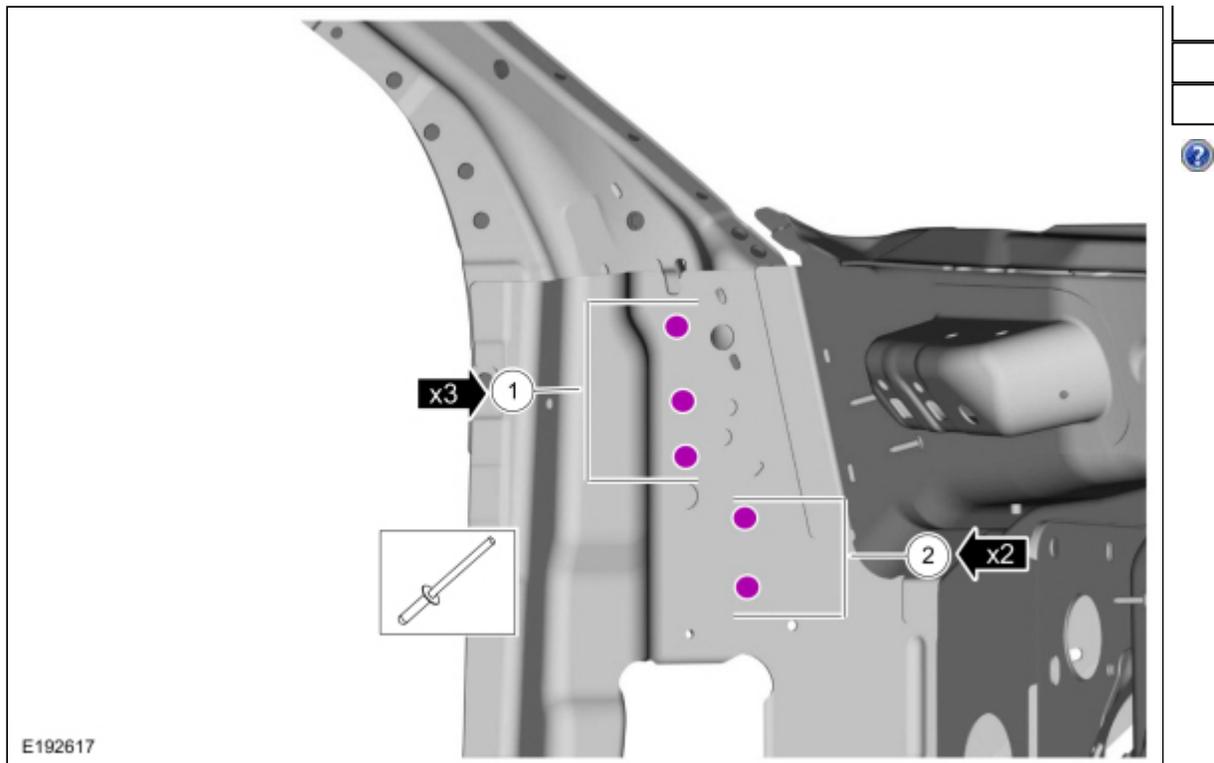


6. Install the fasteners.

Item	SPR Number	SPR Code	Henrob® Car-O- Liner®, CMO®, Chief®, Spanesi® Wielande and Schill® Mandrel	Pro-Spot® Mandrel	Blind Rivet	Solid Rivet	Rivnut®
1	-	-	-	-	W702512-S900C	-	-
2	-	-	-	-	W708777-S900C	-	-

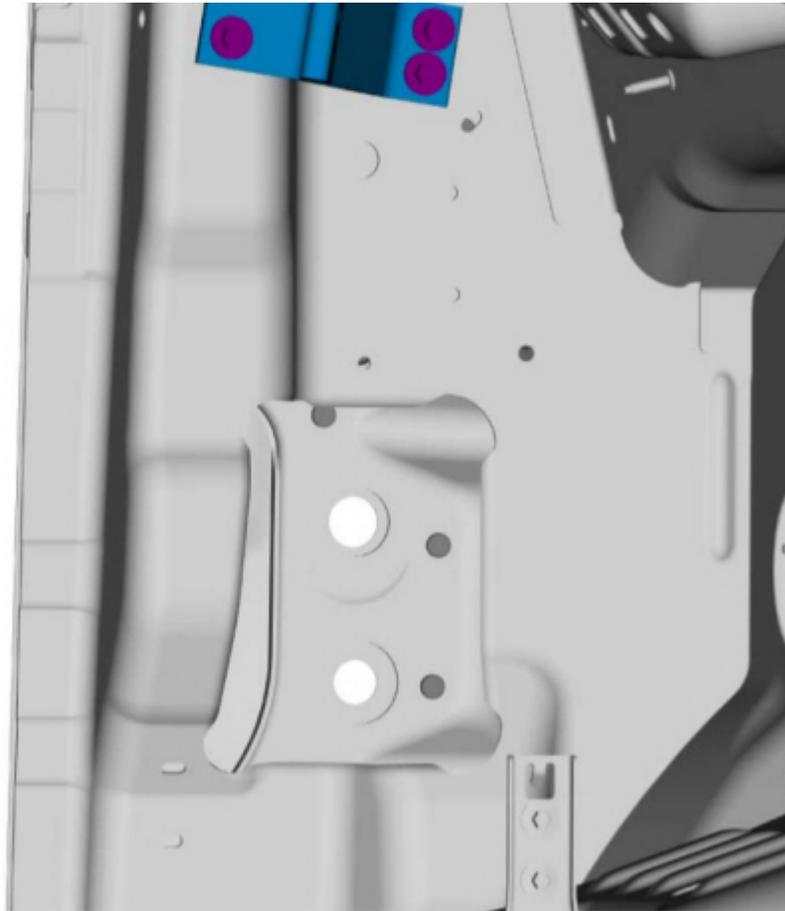
Use the General Equipment: Blind Rivet Gun





7. Install the cross-car beam bracket and bolts.
Torque: 18 lb.ft (25 Nm)





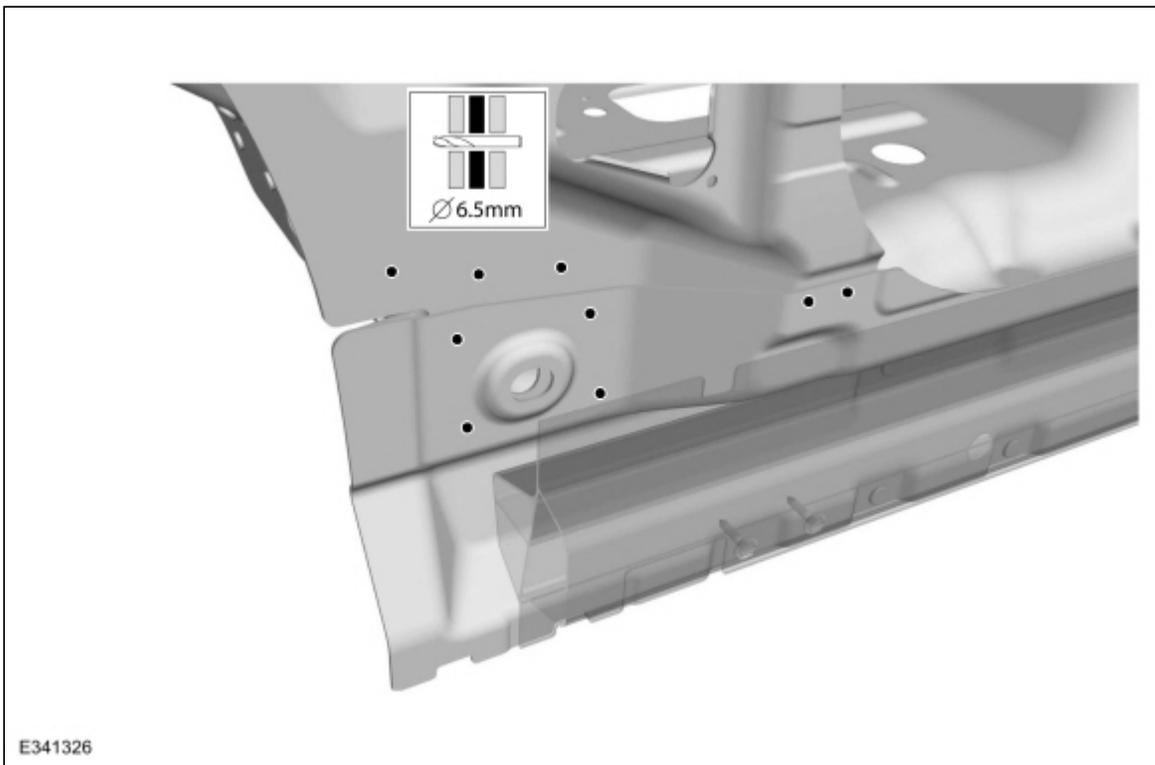
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8. **NOTE:** Do not install SPR fasteners directly in old SPR fastener location. SPR fasteners must be installed adjacent to the original location matching original quantity.

Drill for fasteners.

Use the General Equipment: 6.5 mm Drill Bit





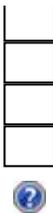
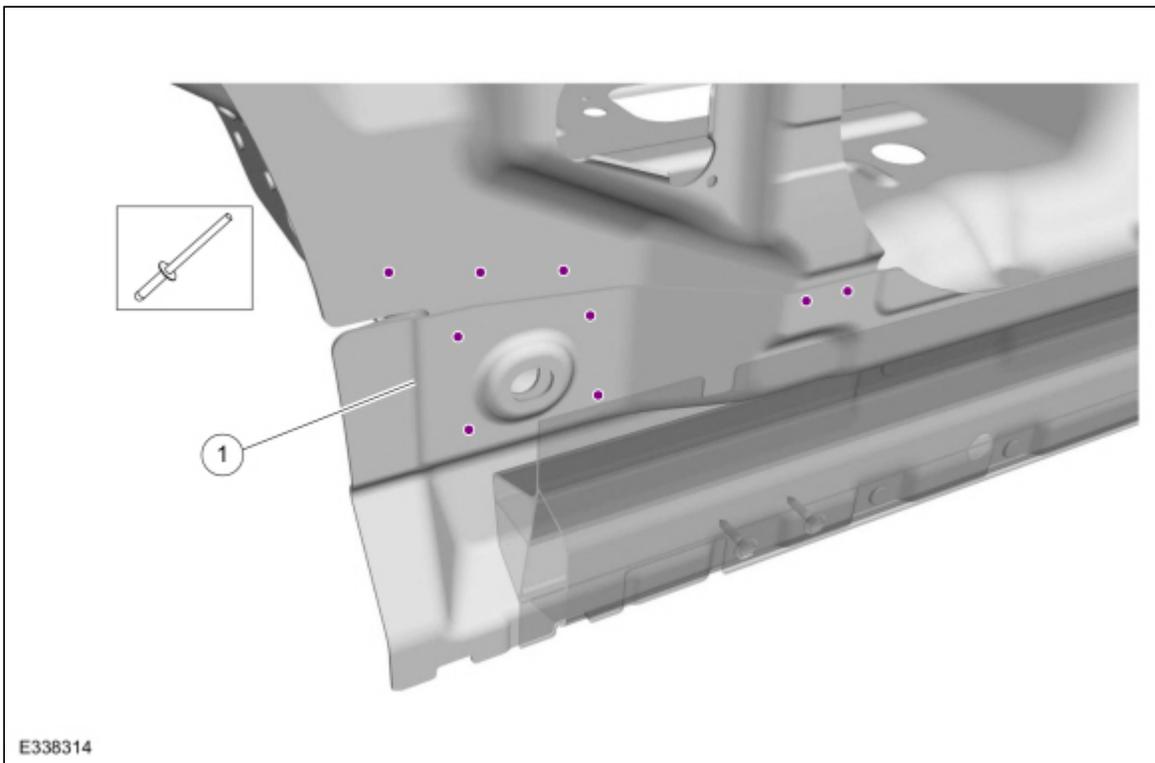
9. **NOTE:** Do not install SPR fasteners directly in old SPR fastener location. SPR fasteners must be installed adjacent to the original location matching original quantity.

NOTE: Solid rivets or blind rivet fasteners may be used in place of SPR fasteners after enlarging existing holes to 6.5 mm.

Install the fasteners.

Item	SPR Number	SPR Code	Henrob® Car-O- Liner®, CMO®, Chief®, Spanesi® Wielande and Schill® Mandrel	Pro-Spot® Mandrel	Blind Rivet	Solid Rivet	Rivnut®
1	-	-	-	-	W708777-S901	-	-





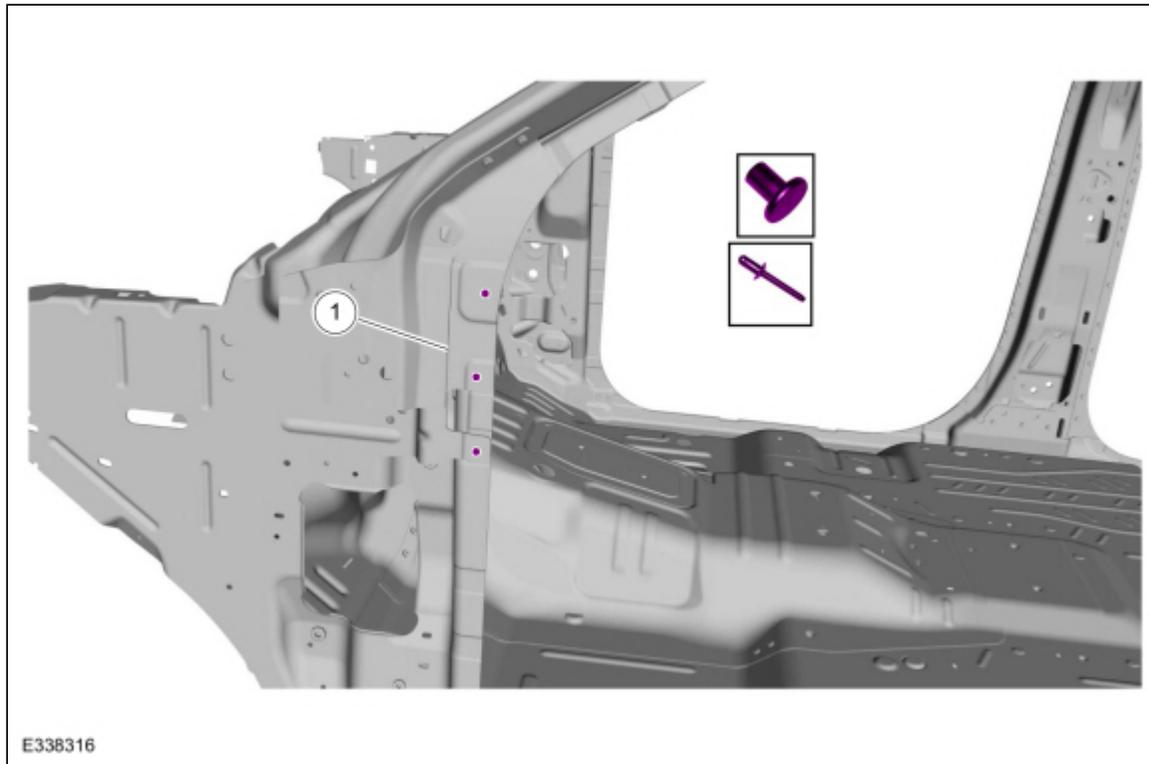
10. **NOTE:** Do not install SPR fasteners directly in old SPR fastener location. SPR fasteners must be installed adjacent to the original location matching original quantity.

NOTE: Solid rivets or blind rivet fasteners may be used in place of SPR fasteners after enlarging existing holes to 6.5 mm.

Install the fasteners.

Item	SPR Number	SPR Code	Henrob® Car-O- Liner®, CMO®, Chief®, Spanesi® Wielande and Schill® Mandrel	Pro-Spot® Mandrel	Blind Rivet	Solid Rivet	Rivnut®
1	W710246-S900	BN	DP10-200/H	SA-0400/SA-0402	W708777-S901	-	-

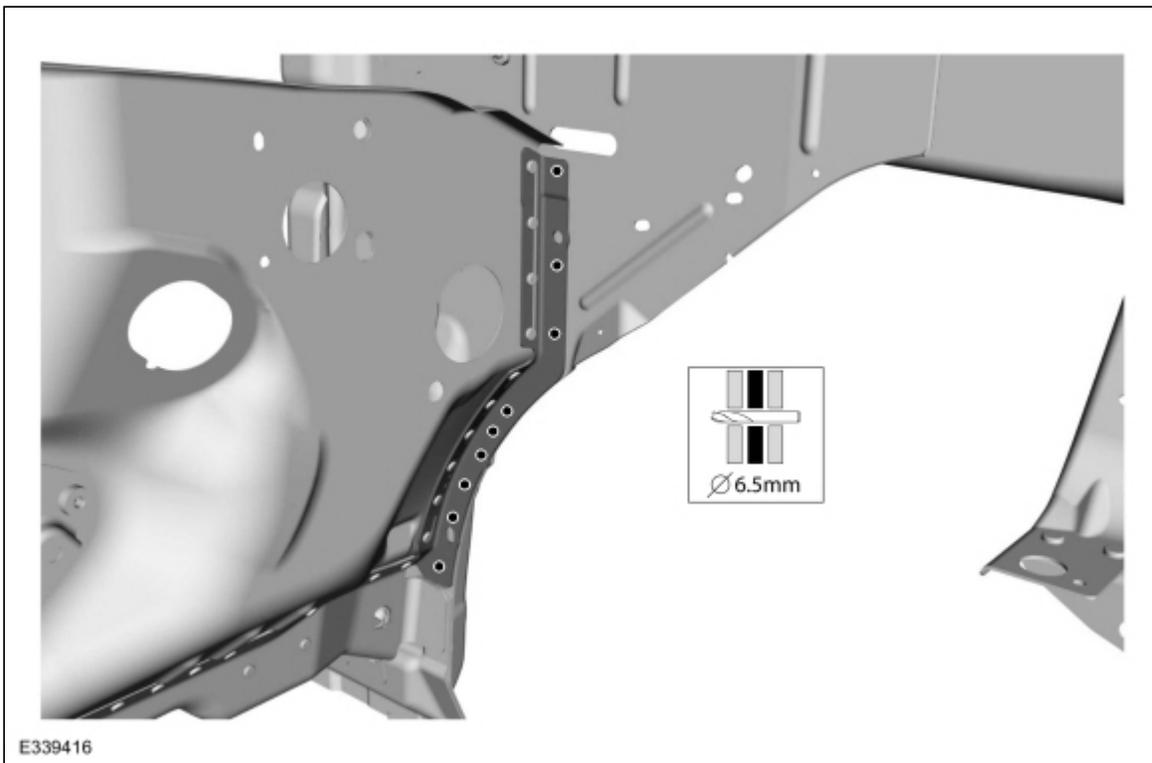




11. **NOTE:** Do not install SPR fasteners directly in old SPR fastener location. SPR fasteners must be installed adjacent to the original location matching original quantity.

Drill for fasteners.
Use the General Equipment: 6.5 mm Drill Bit





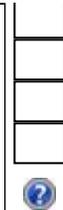
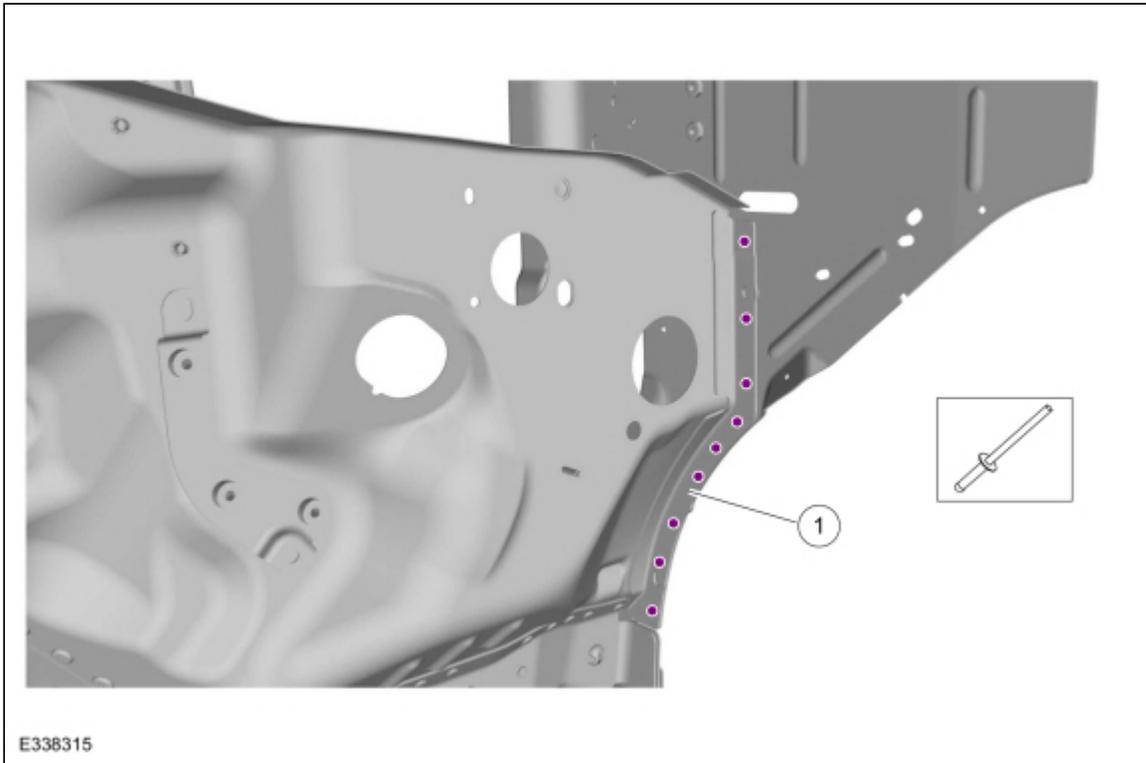
12. **NOTE:** Do not install SPR fasteners directly in old SPR fastener location. SPR fasteners must be installed adjacent to the original location matching original quantity.

NOTE: Solid rivets or blind rivet fasteners may be used in place of SPR fasteners after enlarging existing holes to 6.5 mm.

Install the fasteners.

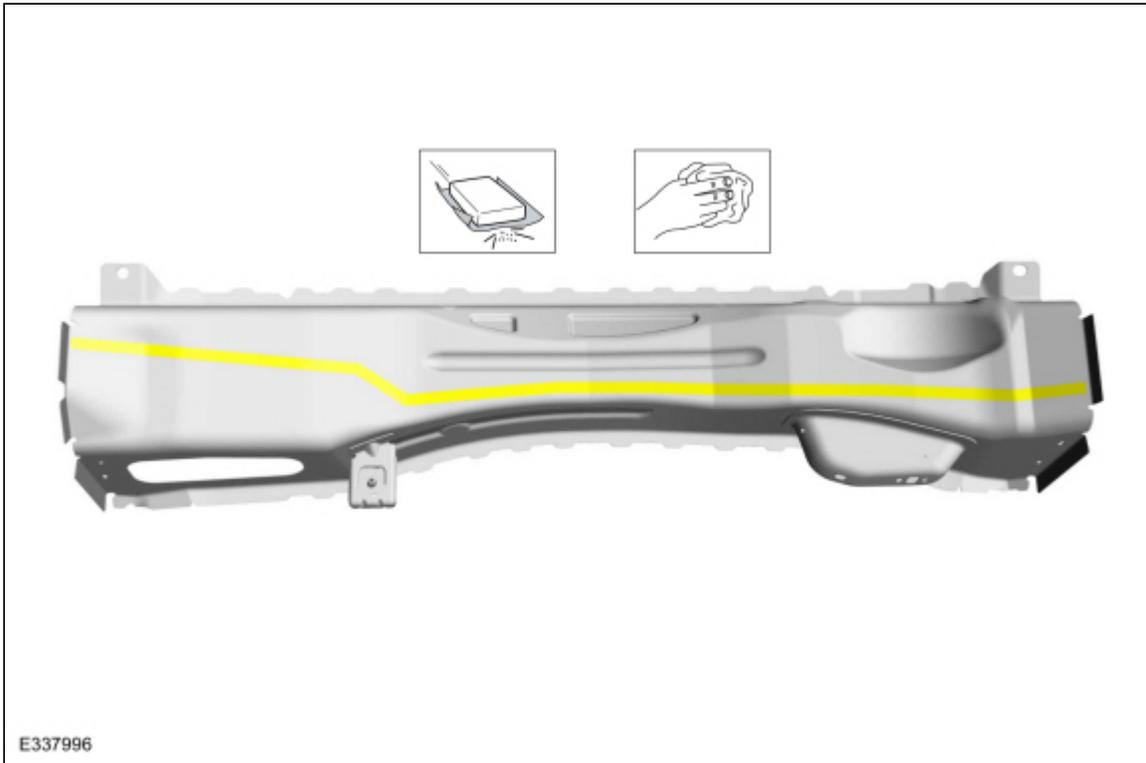
Item	SPR Number	SPR Code	Henrob® Car-O- Liner®, CMO®, Chief®, Spanesi® Wielande and Schill® Mandrel	Pro-Spot® Mandrel	Blind Rivet	Solid Rivet	Rivnut®
1	-	-	-	-	W707638-S900C	-	-





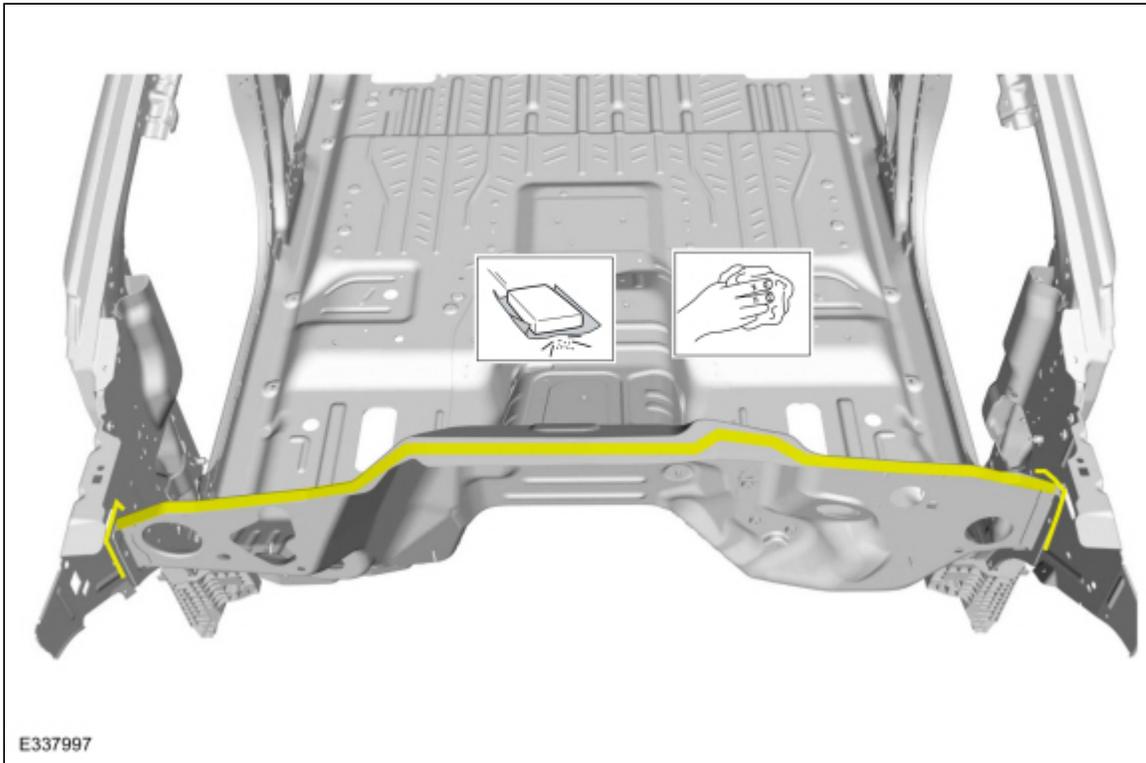
13. Sand the replacement panel in area where adhesive is to be applied.





14. Sand the dash panel mating flange to remove old adhesive.

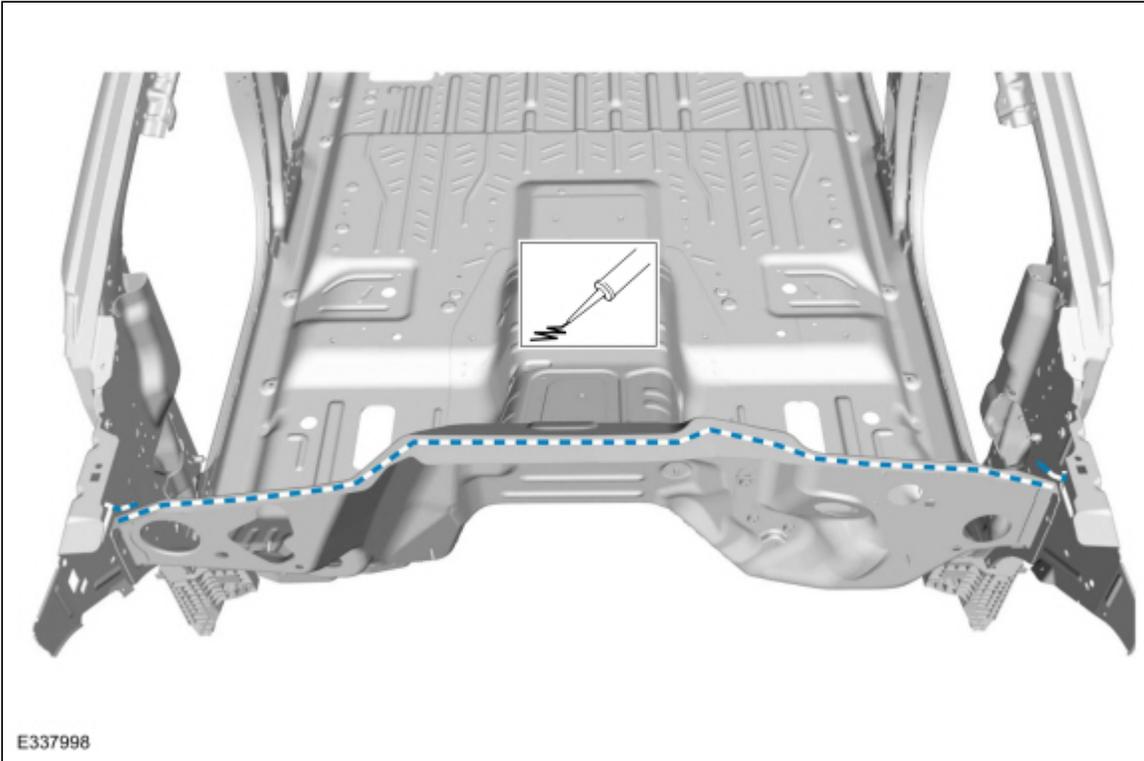




15. Apply adhesive.

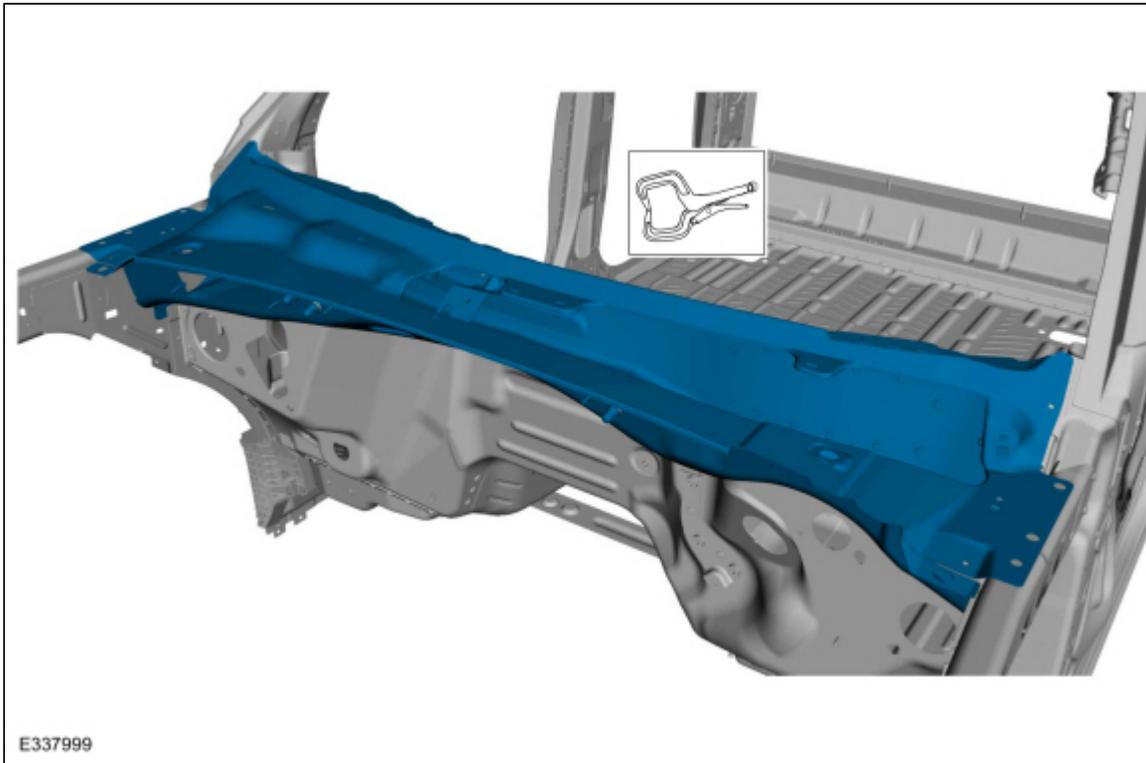
Material: Metal Bonding Adhesive / TA-1, TA-1-B, 3M™ 08115, LORD Fusor® 108B





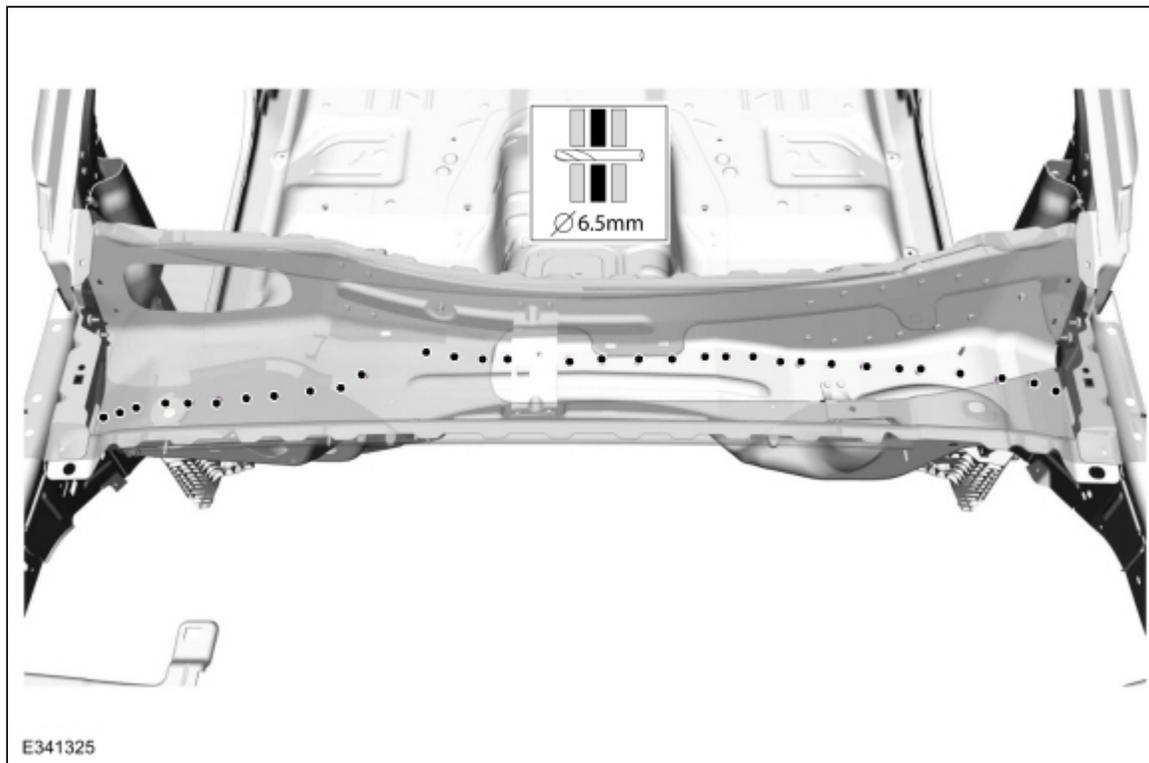
- 16. Install, properly position and clamp the cowl panel.
Use the General Equipment: Locking Pliers





- 17. Drill for fasteners.
Use the General Equipment: 6.5 mm Drill Bit





18. **NOTE:** Do not install SPR fasteners directly in old SPR fastener location. SPR fasteners must be installed adjacent to the original location matching original quantity.

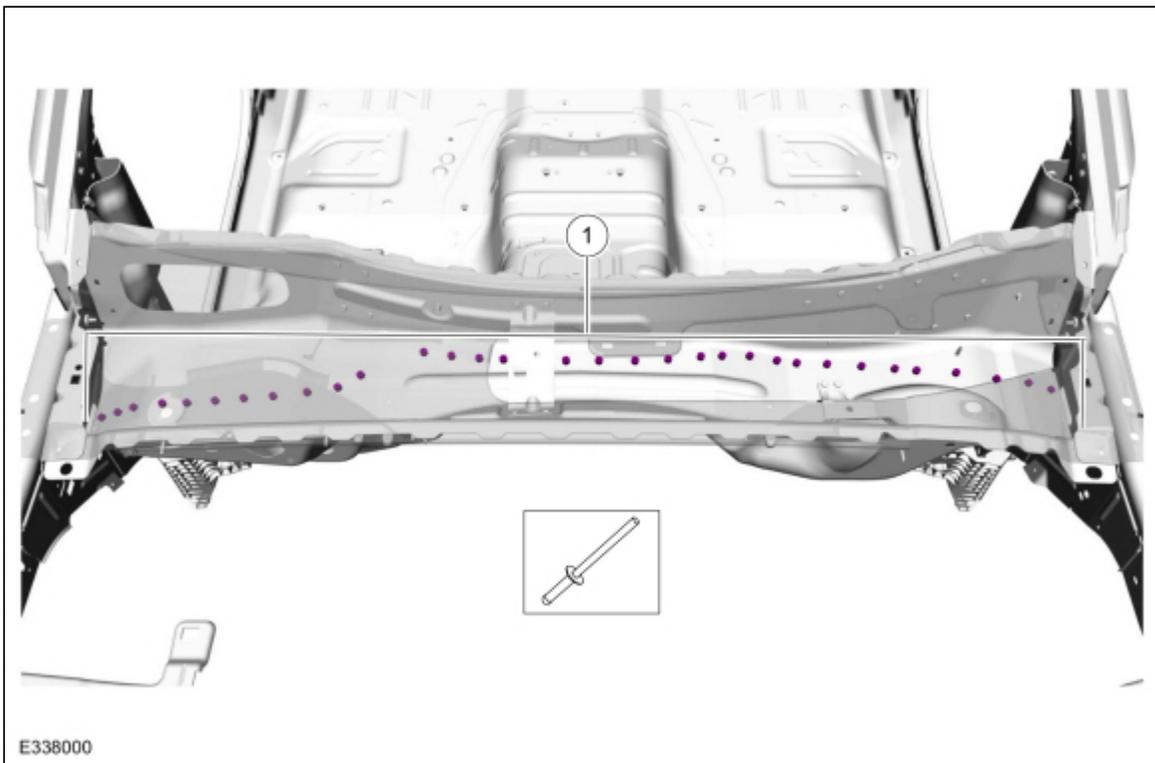
NOTE: Solid rivets or blind rivet fasteners may be used in place of SPR fasteners after enlarging existing holes to 6.5 mm.

Install the fasteners.

Item	SPR Number	SPR Code	Henrob® Car-O- Liner®, CMO®, Chief®, Spanesi® Wielande and Schill® Mandrel	Pro-Spot® Mandrel	Blind Rivet	Solid Rivet	Rivnut®
1	-	-	-	-	W708777-S901	-	-

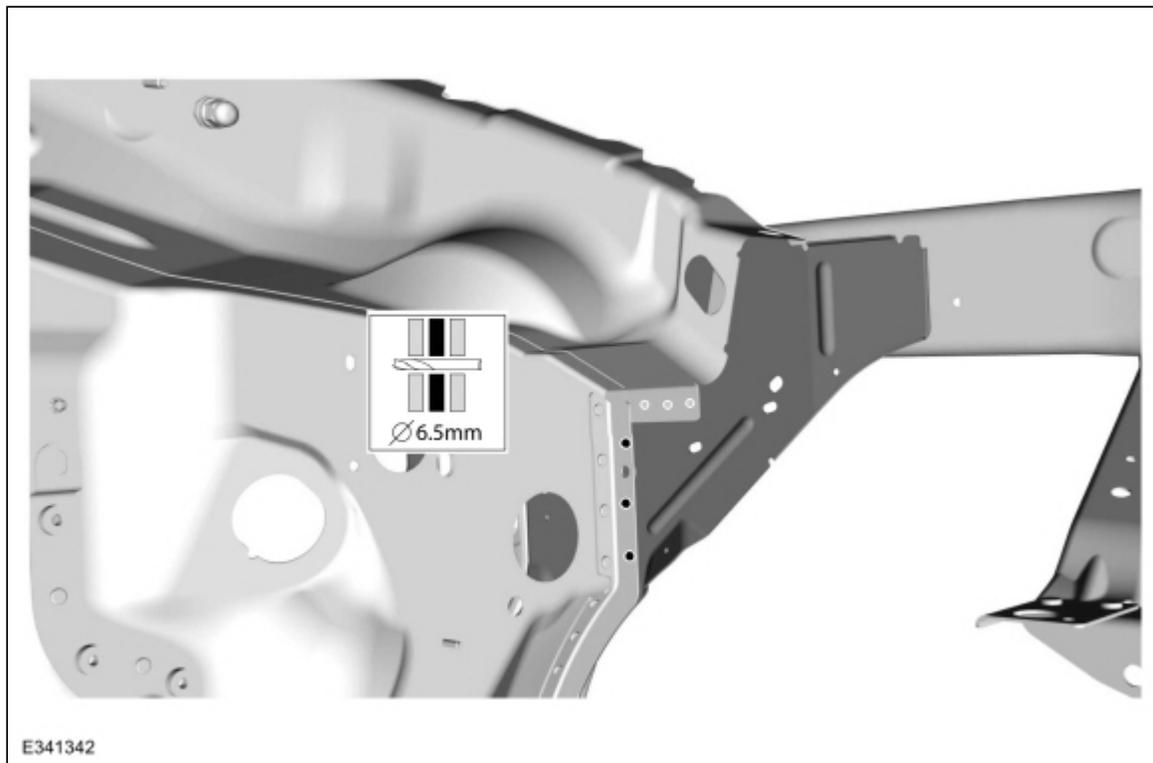
Use the General Equipment: Blind Rivet Gun
 Use the General Equipment: Self-Piercing Rivet (SPR) Remover/Installer





- 19. Drill for fasteners.
Use the General Equipment: 6.5 mm Drill Bit





20. **NOTE:** Do not install SPR fasteners directly in old SPR fastener location. SPR fasteners must be installed adjacent to the original location matching original quantity.

NOTE: Solid rivets or blind rivet fasteners may be used in place of SPR fasteners after enlarging existing holes to 6.5 mm.

Left Hand Side:

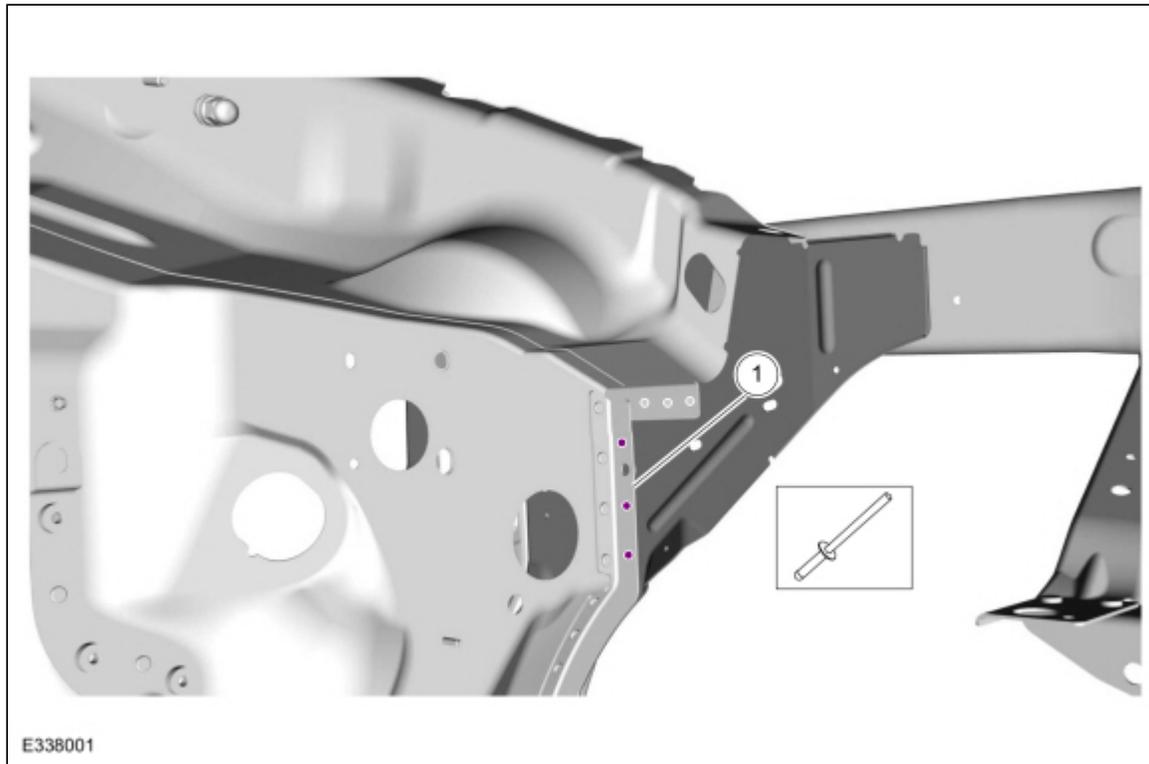
Install the fasteners.

Item	SPR Number	SPR Code	Henrob® Car-O- Liner®, CMO®, Chief®, Spanesi® Wielande and Schill® Mandrel	Pro-Spot® Mandrel	Blind Rivet	Solid Rivet	Rivnut®
1	-	-	-	-	W707638-S900C	-	-

Use the General Equipment: Blind Rivet Gun

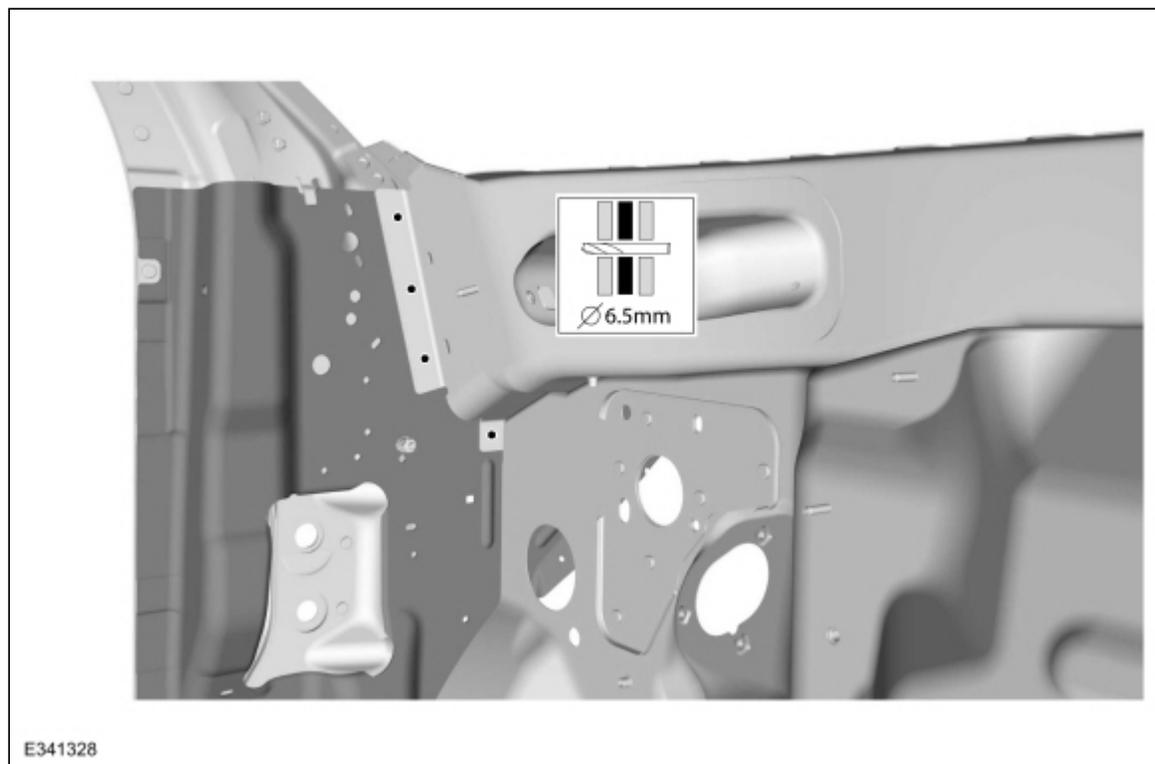
Use the General Equipment: Self-Piercing Rivet (SPR) Remover/Installer





21. Drill for fasteners.
Use the General Equipment: 6.5 mm Drill Bit





22. **NOTE:** Do not install SPR fasteners directly in old SPR fastener location. SPR fasteners must be installed adjacent to the original location matching original quantity.

NOTE: Solid rivets or blind rivet fasteners may be used in place of SPR fasteners after enlarging existing holes to 6.5 mm.

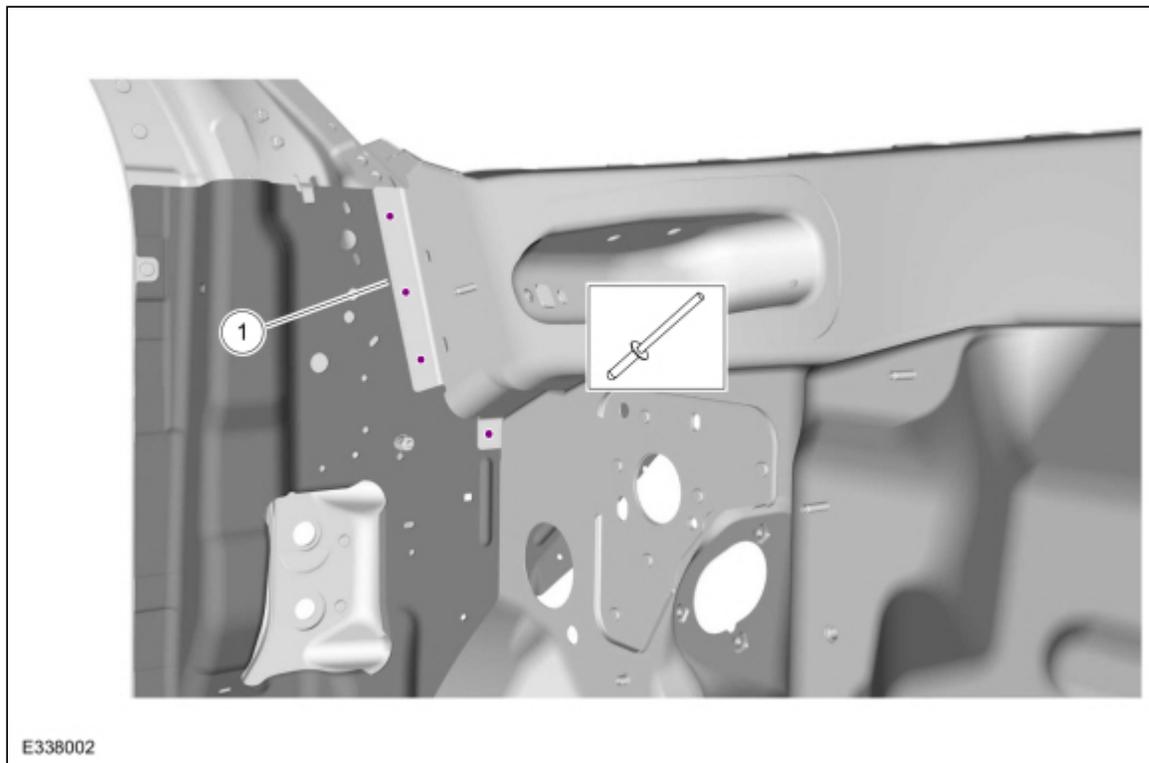
Install the fasteners.

Item	SPR Number	SPR Code	Henrob® Car-O- Liner®, CMO®, Chief®, Spanesi® Wielande and Schill® Mandrel	Pro-Spot® Mandrel	Blind Rivet	Solid Rivet	Rivnut®
1	-	-	-	-	W707638-S900C	-	-

Use the General Equipment: Blind Rivet Gun

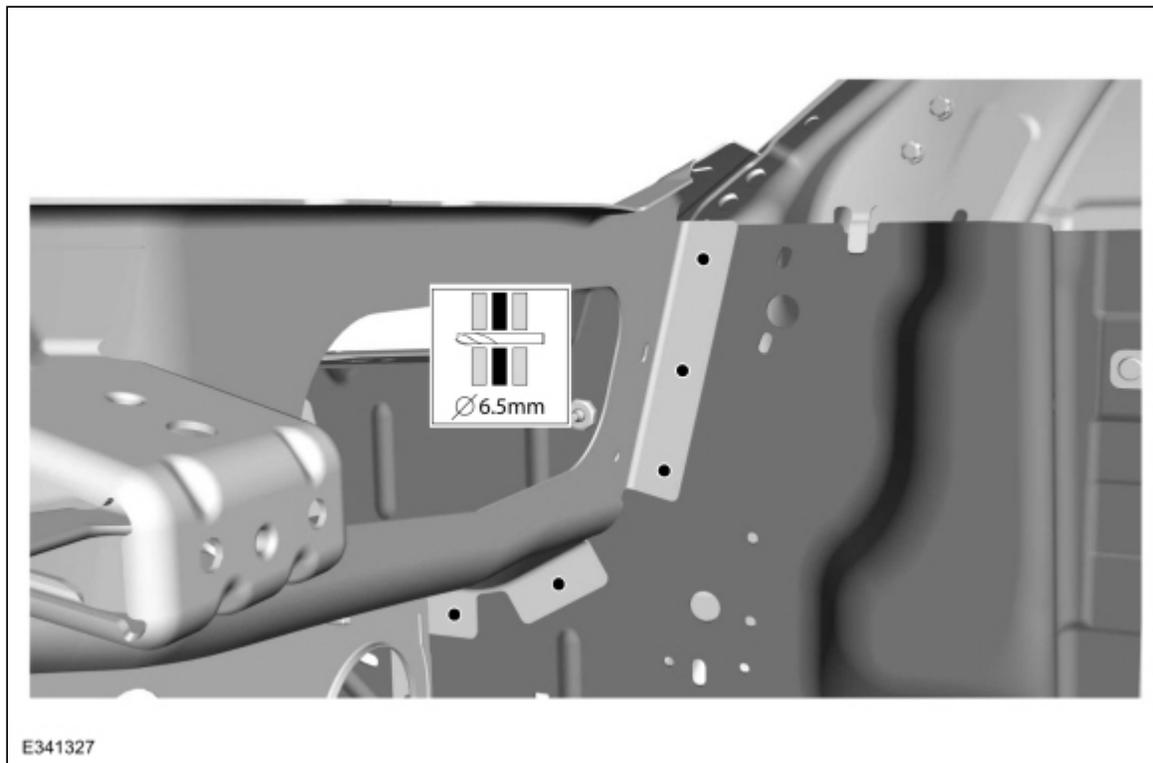
Use the General Equipment: Self-Piercing Rivet (SPR) Remover/Installer





23. Drill for fasteners.
Use the General Equipment: 6.5 mm Drill Bit





24. **NOTE:** Do not install SPR fasteners directly in old SPR fastener location. SPR fasteners must be installed adjacent to the original location matching original quantity.

NOTE: Solid rivets or blind rivet fasteners may be used in place of SPR fasteners after enlarging existing holes to 6.5 mm.

Right Hand Side:

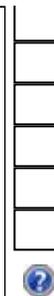
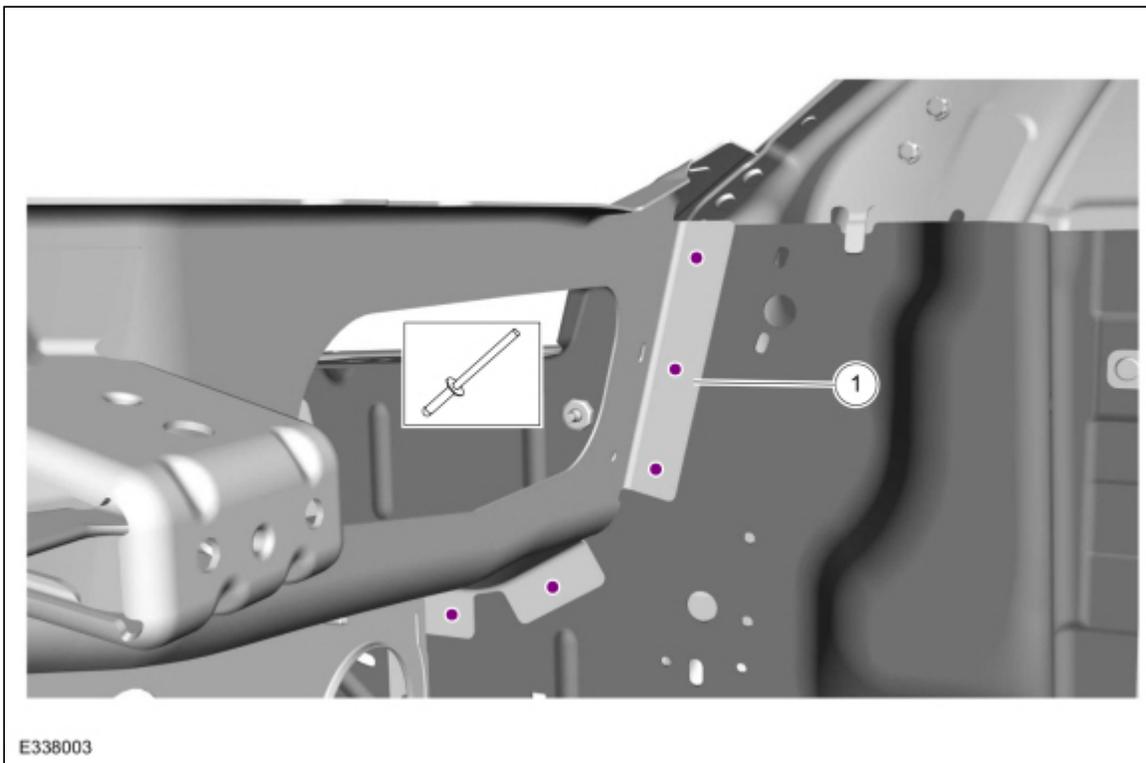
Install the fasteners.

Item	SPR Number	SPR Code	Henrob® Car-O- Liner®, CMO®, Chief®, Spanesi® Wielande and Schill® Mandrel	Pro-Spot® Mandrel	Blind Rivet	Solid Rivet	Rivnut®
1	-	-	-	-	W702512-S901	-	-

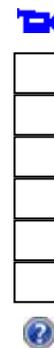
Use the General Equipment: Blind Rivet Gun

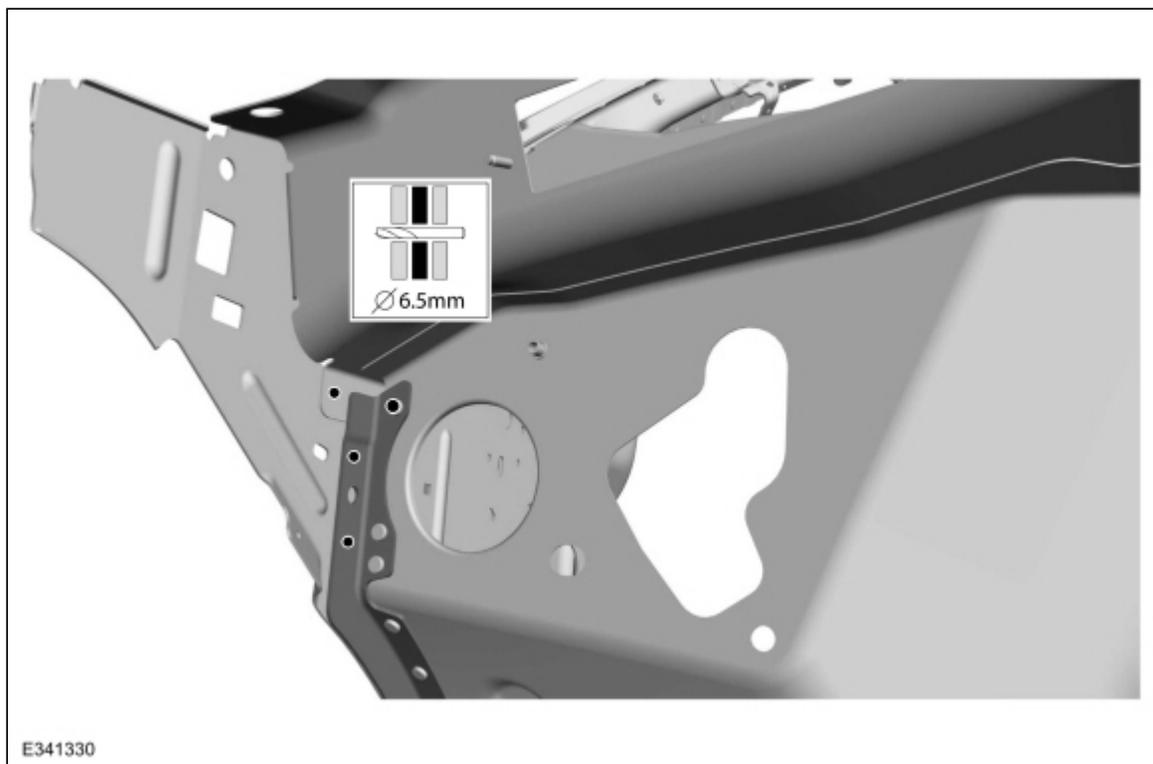
Use the General Equipment: Self-Piercing Rivet (SPR) Remover/Installer





25. Drill for fasteners.
Use the General Equipment: 6.5 mm Drill Bit





26. **NOTE:** Do not install SPR fasteners directly in old SPR fastener location. SPR fasteners must be installed adjacent to the original location matching original quantity.

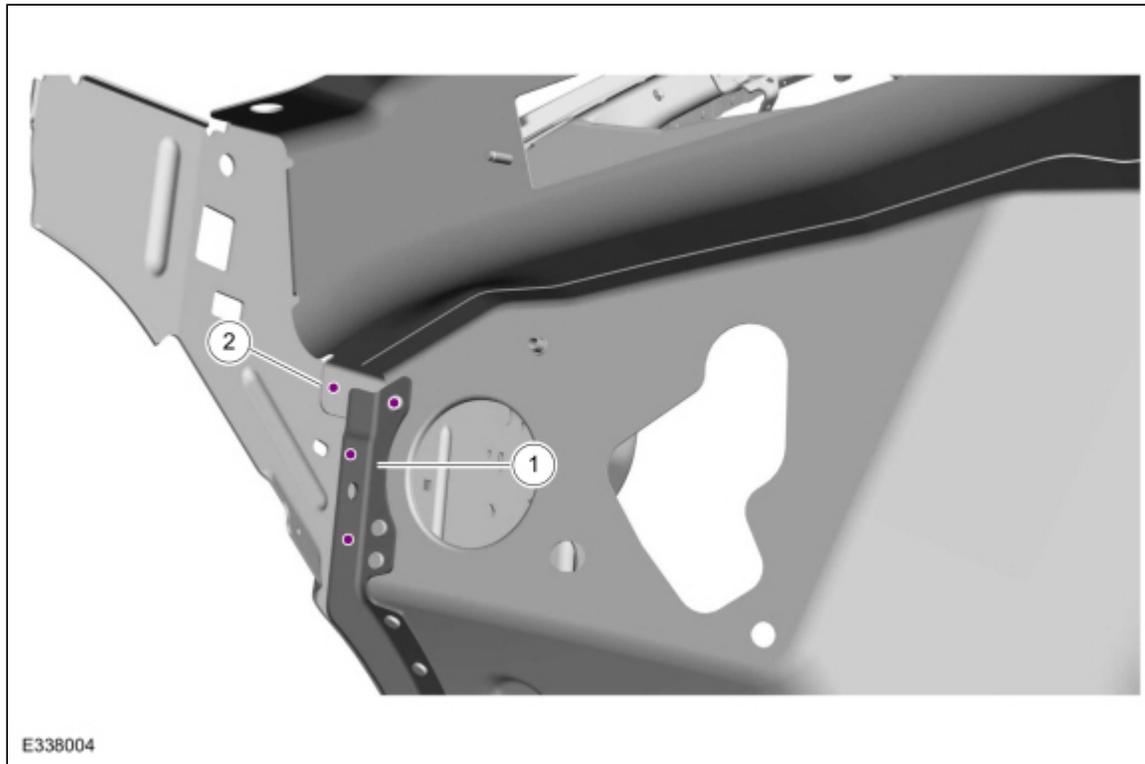
NOTE: Solid rivets or blind rivet fasteners may be used in place of SPR fasteners after enlarging existing holes to 6.5 mm.

Right Hand Side:

Install the fasteners.

Item	SPR Number	SPR Code	Henrob® Car-O- Liner®, CMO®, Chief®, Spanesi® Wielande and Schill® Mandrel	Pro-Spot® Mandrel	Blind Rivet	Solid Rivet	Rivnut®
1	-	-	-	-	W702512-S901	-	-
2	-	-	-	-	W707638-S900C	-	-

Use the General Equipment: Blind Rivet Gun
 Use the General Equipment: Self-Piercing Rivet (SPR) Remover/Installer



27. Metal finish using typical repair techniques.

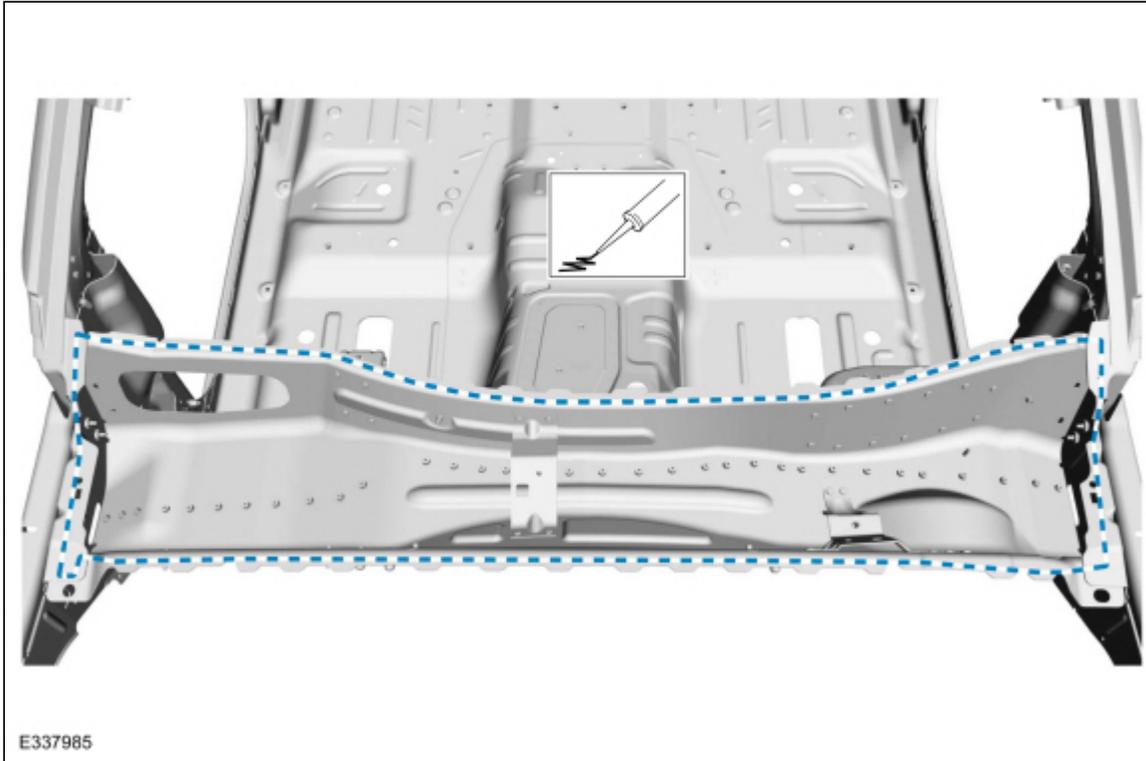
28. **On Both Sides:**

Install the fender apron panel reinforcement.

Refer to: [Fender Apron Panel Reinforcement](#) (501-27 Front End Sheet Metal Repairs, Removal and Installation).

29. Apply adhesive.

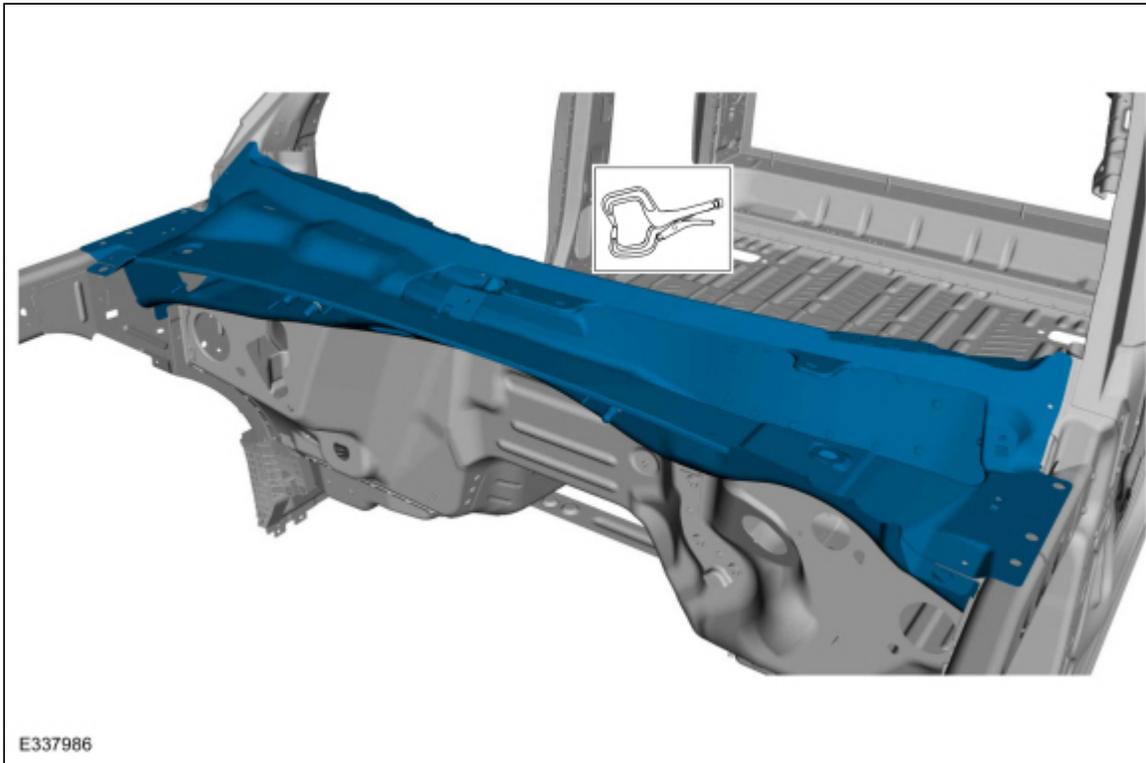
Material: Metal Bonding Adhesive / TA-1, TA-1-B, 3M™ 08115, LORD Fusor® 108B



- 30. Install, properly position and clamp the upper cowl panel.
Use the General Equipment: Locking Pliers

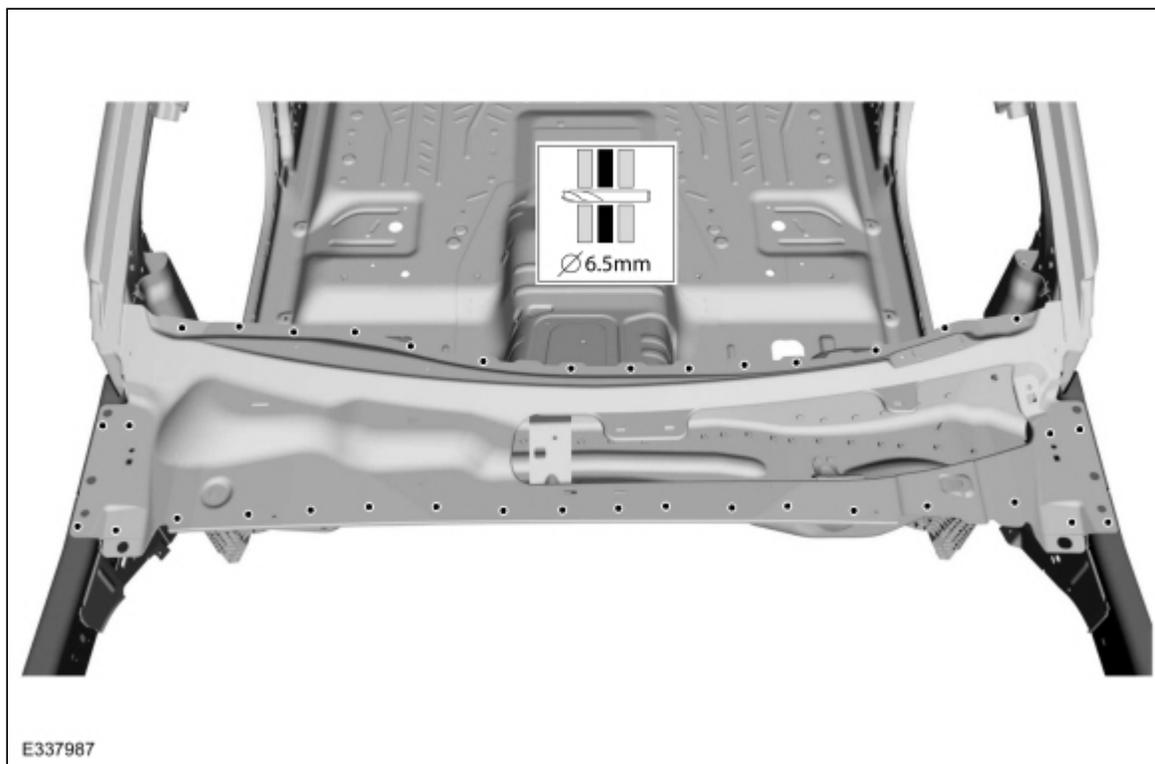






- 31. Drill for rivet fasteners.
Use the General Equipment: 6.5 mm Drill Bit





32. **NOTE:** Do not install SPR fasteners directly in old SPR fastener location. SPR fasteners must be installed adjacent to the original location matching original quantity.

NOTE: Solid rivets or blind rivet fasteners may be used in place of SPR fasteners after enlarging existing holes to 6.5 mm.

On Both Sides:

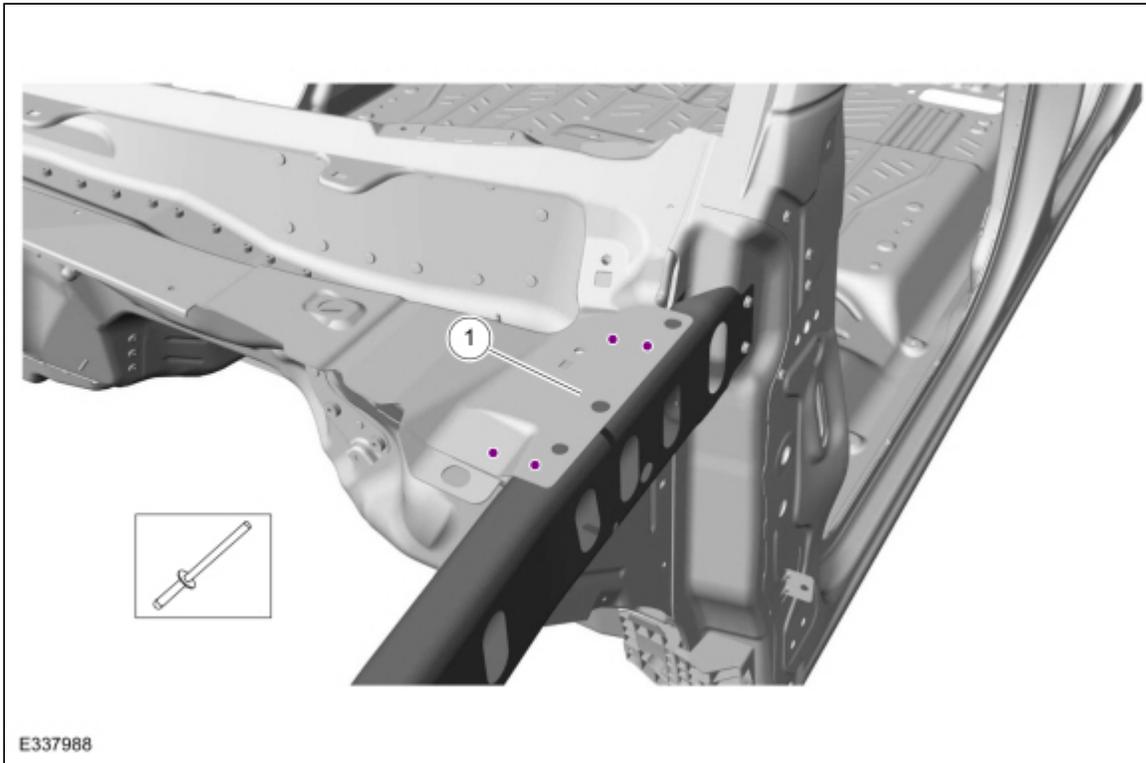
Install the fasteners.

Item	SPR Number	SPR Code	Henrob® Car-O- Liner®, CMO®, Chief®, Spanesi® Wielande and Schill® Mandrel	Pro-Spot® Mandrel	Blind Rivet	Solid Rivet	Rivnut®
1	-	-	-	-	W702512-S901	-	-

Use the General Equipment: Blind Rivet Gun

Use the General Equipment: Self-Piercing Rivet (SPR) Remover/Installer





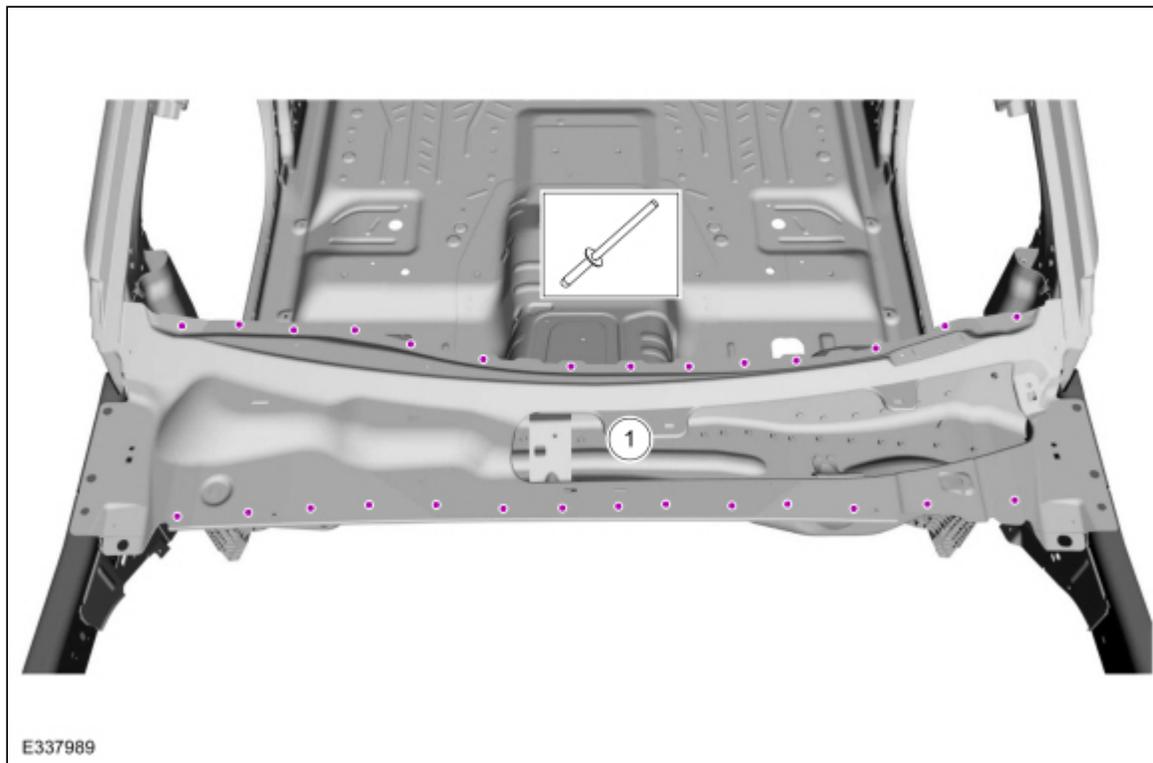
E337988

33. Install the fasteners.

Item	SPR Number	SPR Code	Henrob® Car-O- Liner®, CMO®, Chief®, Spanesi® Wielande and Schill® Mandrel	Pro-Spot® Mandrel	Blind Rivet	Solid Rivet	Rivnut®
1	-	-	-	-	W707638-S901	-	-

Use the General Equipment: Blind Rivet Gun
 Use the General Equipment: Self-Piercing Rivet (SPR) Remover/Installer





34. Seam Sealing:
All seams must be sealed to production level.
35. Refinish the repair area using a Ford approved paint system.
36. Install the A-pillar reinforcement and outer panel.
Refer to: [A-Pillar Outer Panel Section and Reinforcement](#) (501-29 Side Panel Sheet Metal Repairs, Removal and Installation).
Refer to: [A-Pillar Outer Panel](#) (501-29 Side Panel Sheet Metal Repairs, Removal and Installation).
37. Install the instrument panel.
Refer to: [Instrument Panel](#) (501-12 Instrument Panel and Console, Removal and Installation).
38. Install the windshield.
Refer to: [Fixed Glass](#) (501-11 Glass, Frames and Mechanisms, General Procedures).
39. Install the master cylinder.
Refer to: [Brake Fluid Reservoir](#) (206-06 Hydraulic Brake Actuation, Removal and Installation).
40. Install the wiper motor and linkage.
Refer to: [Windshield Wiper Motor](#) (501-16 Wipers and Washers, Removal and Installation).
Refer to: [Wiper Linkage Assembly](#) (501-16 Wipers and Washers, Removal and Installation).

41. Install the cowl panel and cowl panel grille.
Refer to: [Cowl Panel](#) (501-02 Front End Body Panels, Removal and Installation).
Refer to: [Cowl Panel Grille](#) (501-02 Front End Body Panels, Removal and Installation).
42. Reposition wiring harnesses.
43. Install the [PCM](#) .
Refer to: [Powertrain Control Module \(PCM\)](#) (303-14A Electronic Engine Controls - 2.7L EcoBoost (238kW/324PS), Removal and Installation).
Refer to: [Powertrain Control Module \(PCM\)](#) (303-14B Electronic Engine Controls - 3.3L Duratec-V6, Removal and Installation).
Refer to: [Powertrain Control Module \(PCM\)](#) (303-14A Electronic Engine Controls - 2.7L EcoBoost (238kW/324PS), Removal and Installation).
Refer to: [Powertrain Control Module \(PCM\)](#) (303-14D Electronic Engine Controls - 3.5L V6 PowerBoost (CN), Removal and Installation).
Refer to: [Powertrain Control Module \(PCM\)](#) (303-14E Electronic Engine Controls - 5.0L 32V Ti-VCT, Removal and Installation).
Refer to: [Powertrain Control Module \(PCM\)](#) (303-14F Electronic Engine Controls - 3.0L Power Stroke Diesel, Removal and Installation).
44. Repower the [SRS](#).
Refer to: [Supplemental Restraint System \(SRS\) Repowering](#) (501-20B Supplemental Restraint System, General Procedures).

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